DEC 1 1 1943

Heating Piping & Air Conditioning

DESIGN
INSTALLATION
OPERATION
MAINTENANCE

DECEMBER ★ 1943

INDUSTRIAL
COMMERCIAL
AND LARGE
BUILDINGS

e 665: *Journal Section of the American Society of Heating and Ventilating Engineers*

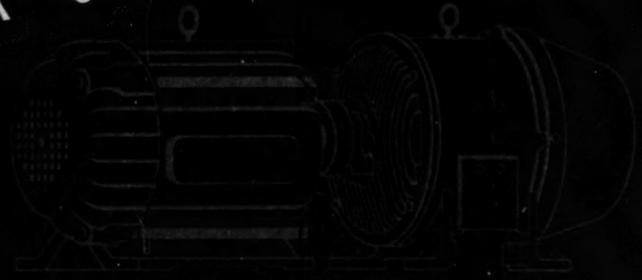
ENGINEERS DECLARE WAR ON HEAT & FUEL WASTE!
. . . see pp. 645-646

CONTENTS . . PAGE 71

C-W

MARK OF DEPENDABILITY

SINCE 1888



C-W has been a *mark of dependability* on motors and generators for over 50 years.

Powering the war effort, on land and sea, may be found many Crocker Wheeler motors and generators which were made over a generation ago . . . yet are serving quietly, faithfully and economically, with a minimum of attention.

If you need rugged, dependable motors and generators, write or wire us, or consult our nearest office. We can make immediate shipment on many types.

CROCKER WHEELER ELECTRIC MANUFACTURING CO.
Ampere, N. J. • Division of JOSHUA HENDY IRON WORKS

CROCKER WHEELER
Motors - Generators

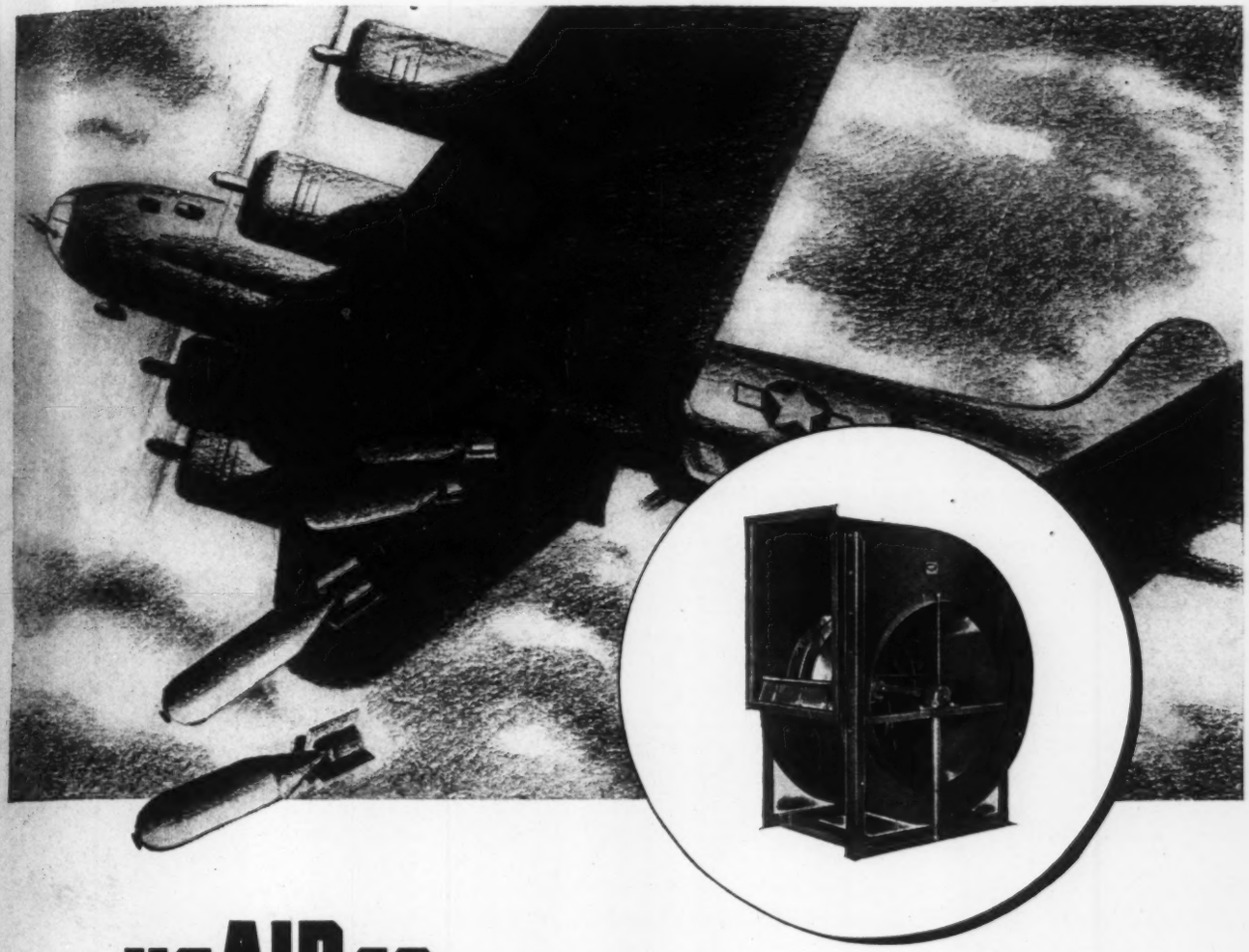
For engineering and service information call

*Boston	(COM 6907)	*Detroit	(TR 2-5785)
*Buffalo	(CL 4985)	New York	(CO 7-6700)
*Chicago	(FRA 1616)	Philadelphia	(WAL 1444)
Cincinnati	(MA 1345)	Pittsburgh	(AT 9818)
*Cleveland	(MA 3255)	*San Francisco	(EX 5531)
Washington	(EX 1991)		

or your local Crocker Wheeler dealer — * Local Stock

Be SURE . . . with
CROCKER-WHEELER

Other JOSHUA HENDY IRON WORKS factories at Sunnyvale, Pomona, Torrance, and Long Beach, California, and St. Louis, Mo.



USAIRCO BLOWERS BUILD BOMBERS

USAIRCO Blowers are a part of the ground crew serving the growing might of the United Nations Air Force.

In airplane factories USAIRCO Blowers perform dependably, to keep workers going at top production pitch, to provide uniform air conditioning for precision machine operation. These Blowers, with other USAIRCO units—heat, ventilate, and cool working areas.

In airports and air bases USAIRCO Blowers help safeguard the health of ground crews, pilots, gunners and crew-members handling giant Bombers.

Thus, from assembly line to training posts and ferry-command stations, USAIRCO Blowers and air tempering equipment help keep Bombers zooming toward the fighting fronts.

USAIRCO Blowers, Coils, Unit Heaters and Air Washers are on today's service fronts in War plants, Munition factories, Army Cantonments and on Shipboard. USAIRCO units are manufactured for performance at rated capacities . . . to do a job within the operating budget.

UNITED STATES AIR CONDITIONING CORPORATION

Manufacturers of the most complete line of air handling equipment. • Factory representatives in principal cities.

NORTHWESTERN TERMINAL • MINNEAPOLIS, MINNESOTA

AIR WASHERS
Single, double and triple stage in capacities for every job of air cleaning, cooling, humidifying, dehumidifying.

UNIT HEATERS
Suspended type steam heating units equipped with Deflecto Grilles for distributing heat in any direction.

COILS
Cooling, heating and air conditioning Coils-fin type with high heat transfer efficiency.

"SU" BLOWERS
Type "SU" exhaust fan designed for all applications where direct-driven motor-fan unit is required.

"E" BLOWERS
Typical light duty belt-driven exhaust blower of type approved for exhaust application.

HEATING, PIPING & AIR CONDITIONING, published monthly by Keeney Publishing Co., 6 N. Michigan Ave., Chicago 2, Ill., U. S. A. Subscription rates: U. S. and possessions, Canada, Mexico, Central America, South America, $2.00 per year; other $4.00. Current copies, U. S. and possessions, 25 cents. Back numbers, 50 cents. December, 1943. Vol. 15, No. 12. Entered as Second Class Matter May 18, 1929, at the Post Office at Chicago, Ill., U. S. A., under the Act of March 3, 1879.

Many busy war plants are operating continuously day and night knowing full well that their carrying lines will require no downtime for rust-caused repairs. For, in the prewar era, they were equipped with rustproof copper tubes.

In addition to being rustproof, Anaconda Copper Tubes are easily and economically installed with solder-type fittings. Pumping costs are lower because their smooth interiors are less resistant to flow. They bend easily . . . save space. And because they can be assembled so quickly with soldered joints such installations keep labor and material costs down.

In the event of changes in plant layout, copper tube lines may be disassembled and reinstalled with a minimum of expense.

Present use of copper tubes is curtailed by war demands. But it will pay you to look ahead to when this worthwhile piping is again generally available. Publication C-24, sent on request, describes industrial applications of Anaconda Copper Tubes. ASS4

BUY WAR BONDS FOR VICTORY

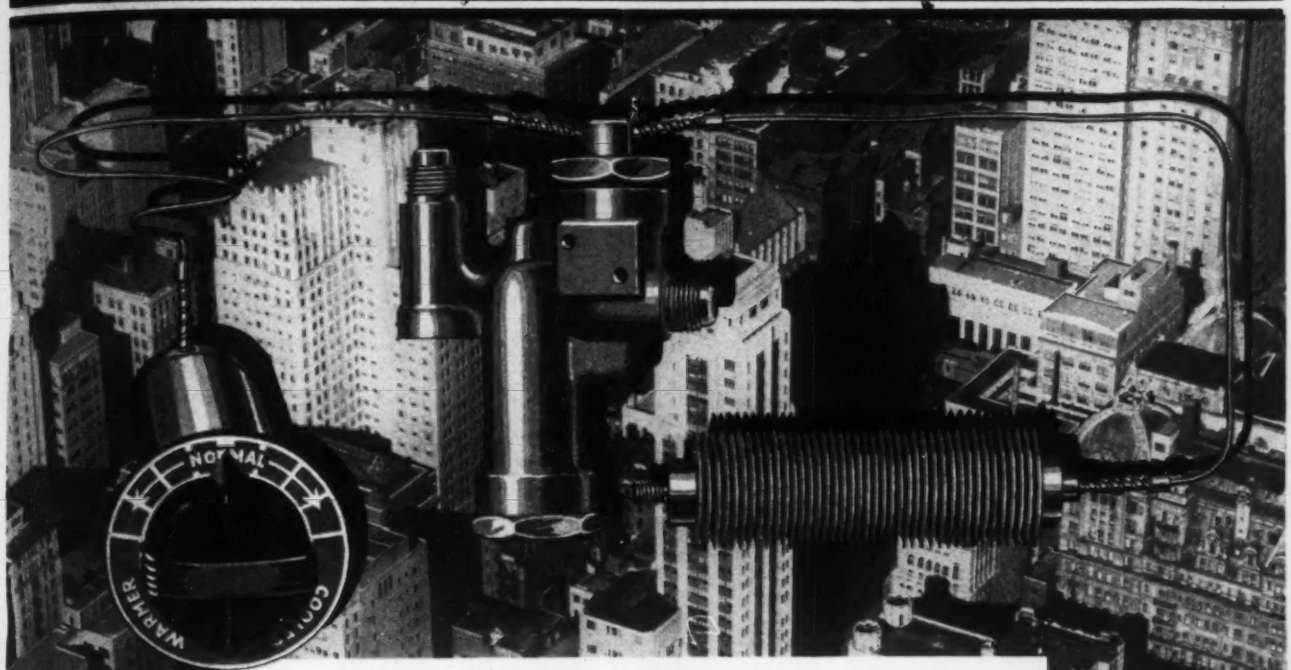
ANACONDA

Anaconda Copper Tubes

THE AMERICAN BRASS COMPANY—General Offices: Waterbury 88, Connecticut

Subsidiary of Anaconda Copper Mining Company • In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ontario

AND NOW...
"The Thinking Valve"



That is the name engineers have dubbed this new, year-'round room temperature control, cooperatively developed by Carrier and Fulton Sylphon engineers.

Operating to control flow of hot or chilled water to individual room conditioning units, it automatically switches over from winter to summer control and vice versa when the central conditioning system operation is changed over.

It operates with the same accuracy of control on both cycles and affords all the advantages of modulation.

Self-contained and independent, it functions to satisfy each individual room's temperature requirement, year-'round.

Another example of Fulton Sylphon's collaboration with leading air conditioning engineers and equipment manufacturers to produce startling improvements in control design and application.

Look to Fulton Sylphon for the best in *modulating* control for your postwar planning.

THE FULTON SYLPHON CO.
KNOXVILLE, TENNESSEE

Fresh food on the high seas during long, heavy-action periods away from port is the result of compact, efficient refrigeration.
Self-Contained ¼ h.p. Refrigerating Unit
Cool, clean air protects the life of the wounded in Army hospitals. Special aircraft refrigerators safeguard serums and plasma.
Aluminum Aircraft Refrigerator
Peak welding efficiency is made possible by cooling of welding tips with water or brine held at the right temperature.
Spot Welder Tip Cooling Unit
Tool life is increased and rejections are fewer when cutting oils used in high-speed machining are properly cooled.
Refrigerating Unit
The health of our armed forces is protected by dependable refrigeration in cantonments, huts, barracks, and on ships.
14 Cylinder Refrigerating Compressor
Super accuracy in gauge rooms is possible when the air is clean, dehumidified, and maintained at a constant temperature.
3 h.p. "Packaged" Air Conditioner
Protection in the tropics against the ravages of humid atmosphere and vermin is necessary to preserve food and equipment.
Portable Panel Refrigeration Unit
Identical performance of aircraft engines is assured by operation tests with carburetor air kept at the same temperature.
14 Cylinder Air Conditioning Compressor
Clean, dry atmosphere is vital for machining sensitive metal surfaces where a spot of rust would ruin high-precision products.
5 h.p. "Packaged" Air Conditioner

★ CHRYSLER AIRTEMP AT WAR ★

From tiny, fractional horsepower to big 75 horsepower units, Chrysler Airtemp Radial Compressors are performing a major war job on both the production and battle fronts.

The science of air control is built around the compressor. Chrysler Airtemp's *exclusive* Variable Capacity Radial Compressor provides a new efficiency and accuracy in indoor climate regulation. The radial cylinders cut in or out automatically, one at a time, to meet varying load requirements. This flexibility eliminates the peaks and valleys resulting from abrupt starting and stopping of ordinary compressors . . . holds temperature and humidity at a constant level.

Years spent in building delicate mechanisms, have developed high-precision, versatile skills at Airtemp, now devoted to war production. Backed by Chrysler Corporation research and engineering, when peace comes, these skills will again create heating, cooling and refrigeration units for homes and commercial use that will set new, high standards of efficiency and performance.

The lessons learned during peace in free competitive enterprise—freedom of the individual to produce and compete—today bring strength to a nation at war.

War Products of Chrysler Corporation

Tanks • Tank Engines • Navy Anti-Aircraft Guns • Army Anti-Aircraft Guns • Bomber Fuselage Sections • Bomber Wings • Bomb Racks • Bomb Shackles • Fighter Landing Gears • Aluminum Alloy Forgings • Aluminum Alloy Castings • High-Powered Aircraft Engines • Cycleweld Cement • Wide Variety of Ammunition • Anti-Tank Vehicles • Command Reconnaissance Cars • Troop and Cargo Motor Transports • Ambulances • Weapons Carriers • Gyro-Compasses • Navy Pontoons • Marine Tractors • Harbor Tugs • Marine and Industrial Engines • Smoke Screen Generators • Air Raid Sirens and Fire Fighting Equipment • Powdered Metal Parts • Cantonment Furnaces • Tent Heaters • Refrigeration Compressors • Field Kitchens • and Other Important War Equipment

Tune in Major Bowes every Thursday, C B S, 9 P. M., E. W. T.

Chrysler Corporation

PLYMOUTH • DODGE • DE SOTO • CHRYSLER • AIRTEMP • AMPLEX

BACK THE ATTACK—BUY WAR BONDS

THOROUGH CLEANING

another advantage of

MIDWEST

PRE-FABRICATED PIPING

Piping subassemblies that are pre-fabricated by Midwest are thoroughly cleaned before leaving our various plants. All scale, dirt and other accumulated impurities that otherwise would cause serious damage to valves, turbine blading, etc. are removed.

You do not have to waste time in cleaning Midwest Pre-Fabricated Piping . . . it is delivered ready to erect. The careful checking in our shops to make sure dimensions and alignment are correct . . . the searching inspection and shop testing . . . are other important time-saving advantages of Piping by Midwest.

• • •

Midwest Piping Service can be used to advantage whenever you need piping . . . whether a simple pipe bend or a complex high pressure piping job. Three modern fabricating plants are strategically located to serve you . . . and an experienced Erecting Division will take full responsibility for a complete piping installation.

MIDWEST

MIDWEST PIPING SERVICE IS NATION-WIDE

MIDWEST PIPING & SUPPLY COMPANY, INC.

American Blower Equipment in the

America's automotive industry has won world-wide fame for efficiency and mass production methods. Passenger car production for the United States and Canada reached its peak in 1941 (last pre-war year of unlimited production) when 3,838,345 passenger cars and 1,270,647 trucks rolled off the lines. Yet the war production of this great industry makes even these totals look small.

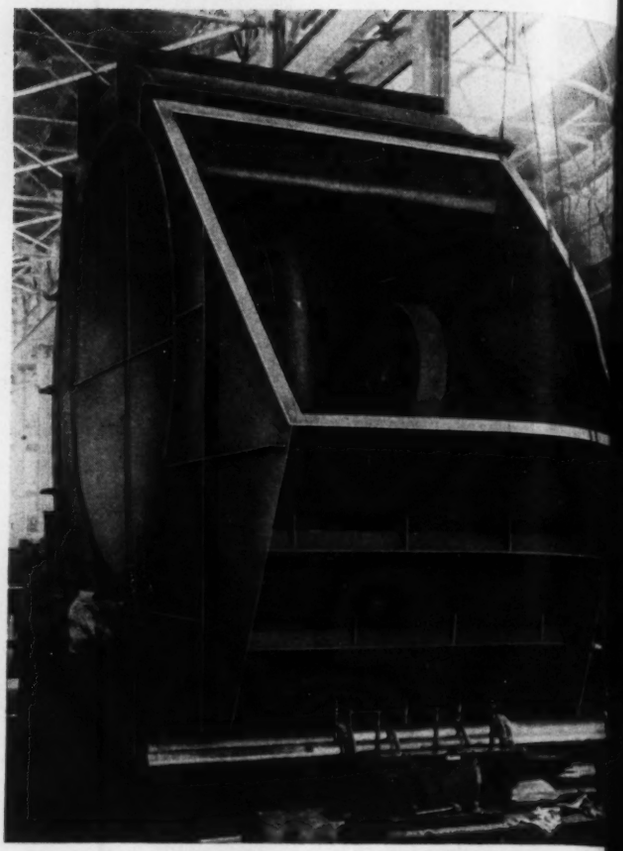
For many years, American Blower dust collectors, fans for air circulating and ventilating and for exhausting fumes from paint spray booths, foundries, etc., have been a stand-by in the automotive industry, as well as in all other great American industries.

After Victory, the experience gained by American Blower in furnishing vital air handling equipment to all industries will be available to you for your plant or process.

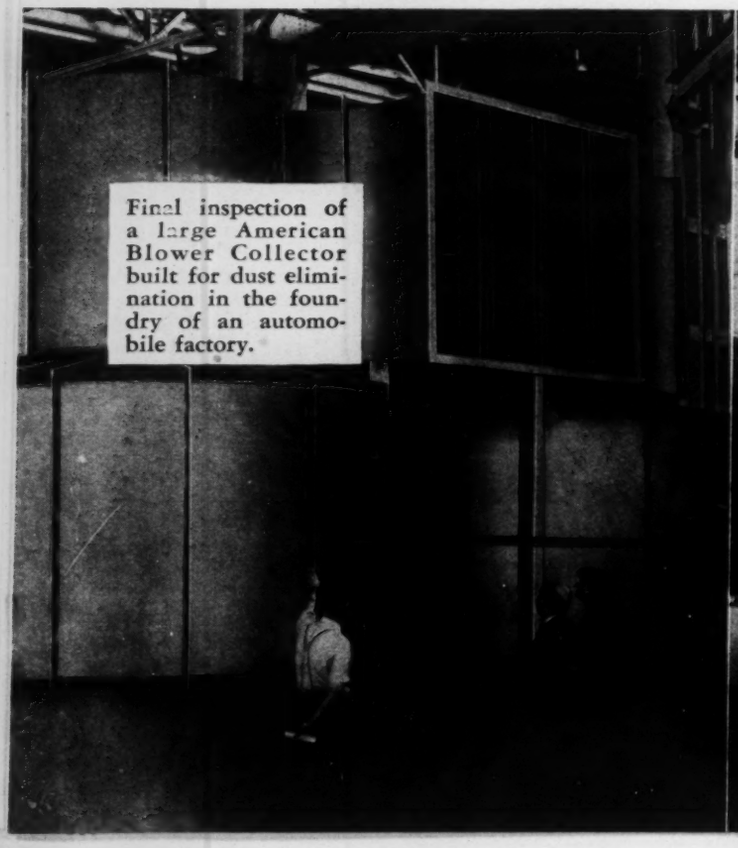
AMERICAN BLOWER

ARMY E NAVY
For Production "Well Done"

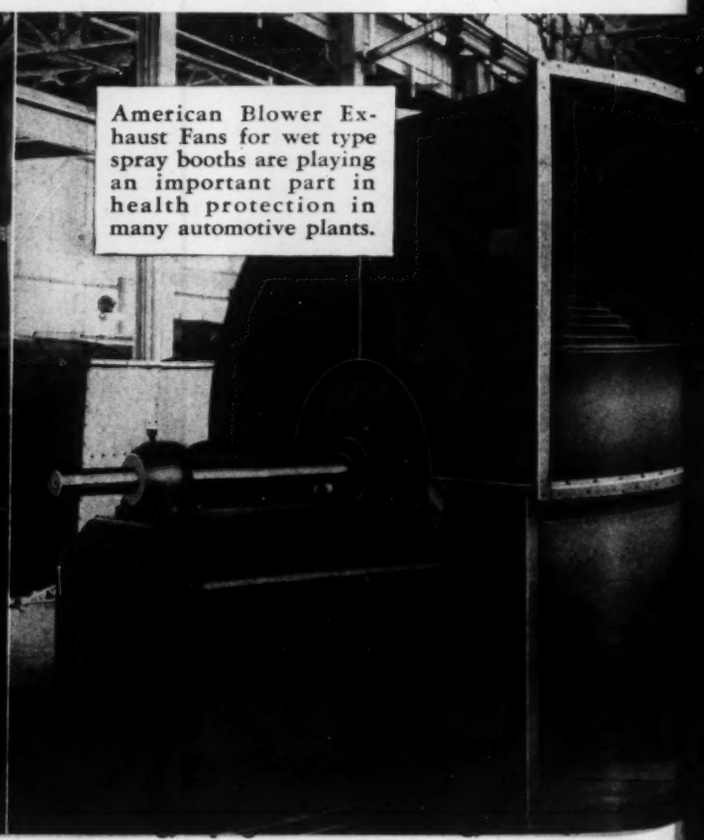
AMERICAN BLOWER CORPORATION, DETROIT, MICH.
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONT.
Division of American Radiator and Standard Sanitary Corporation



Large American Blower Supply Fan used as a part of a central system for air circulation and ventilation in an automotive assembly plant.

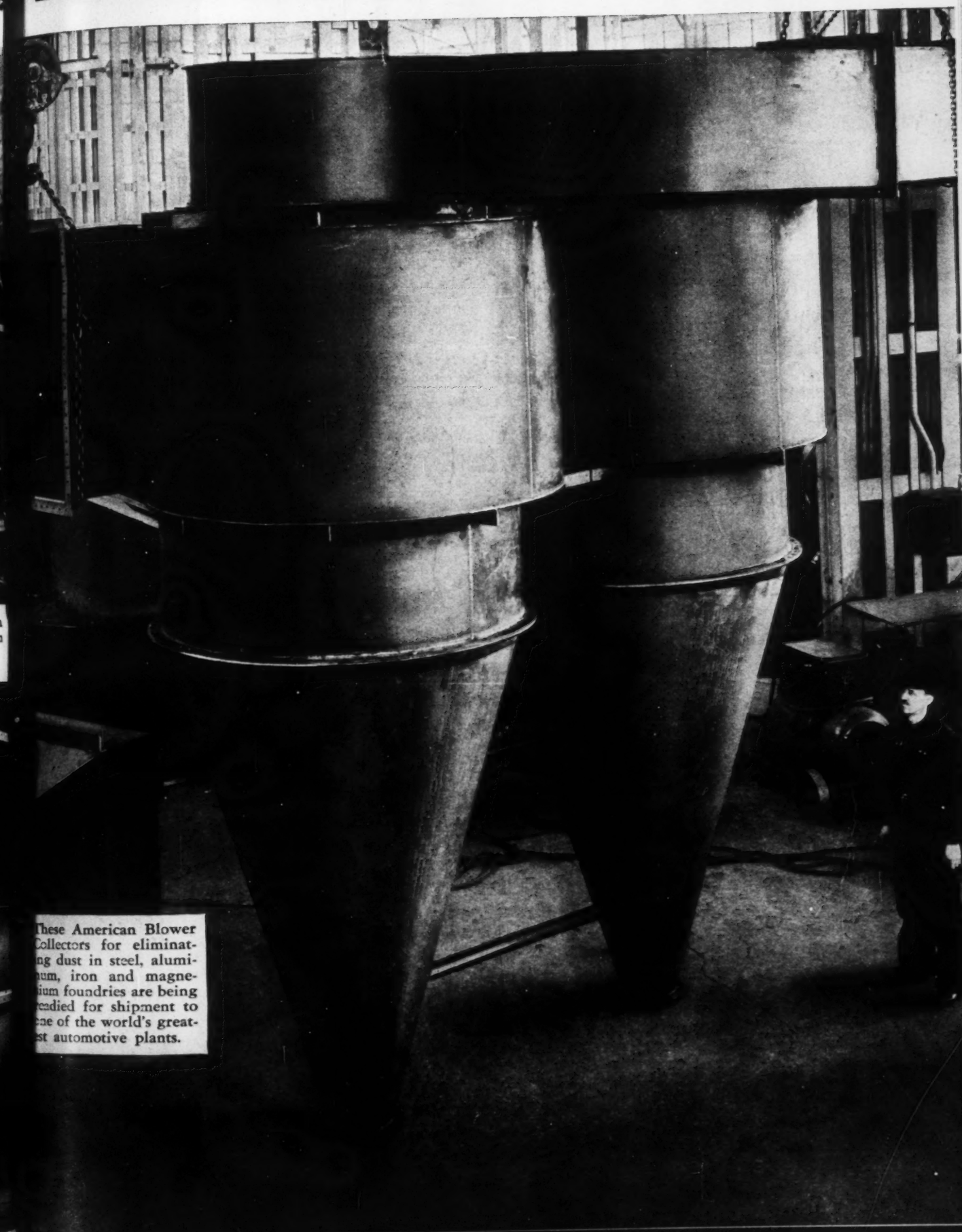


Final inspection of a large American Blower Collector built for dust elimination in the foundry of an automobile factory.



American Blower Exhaust Fans for wet type spray booths are playing an important part in health protection in many automotive plants.

AUTOMOTIVE INDUSTRY



These American Blower Collectors for eliminating dust in steel, aluminum, iron and magnesium foundries are being readied for shipment to one of the world's greatest automotive plants.

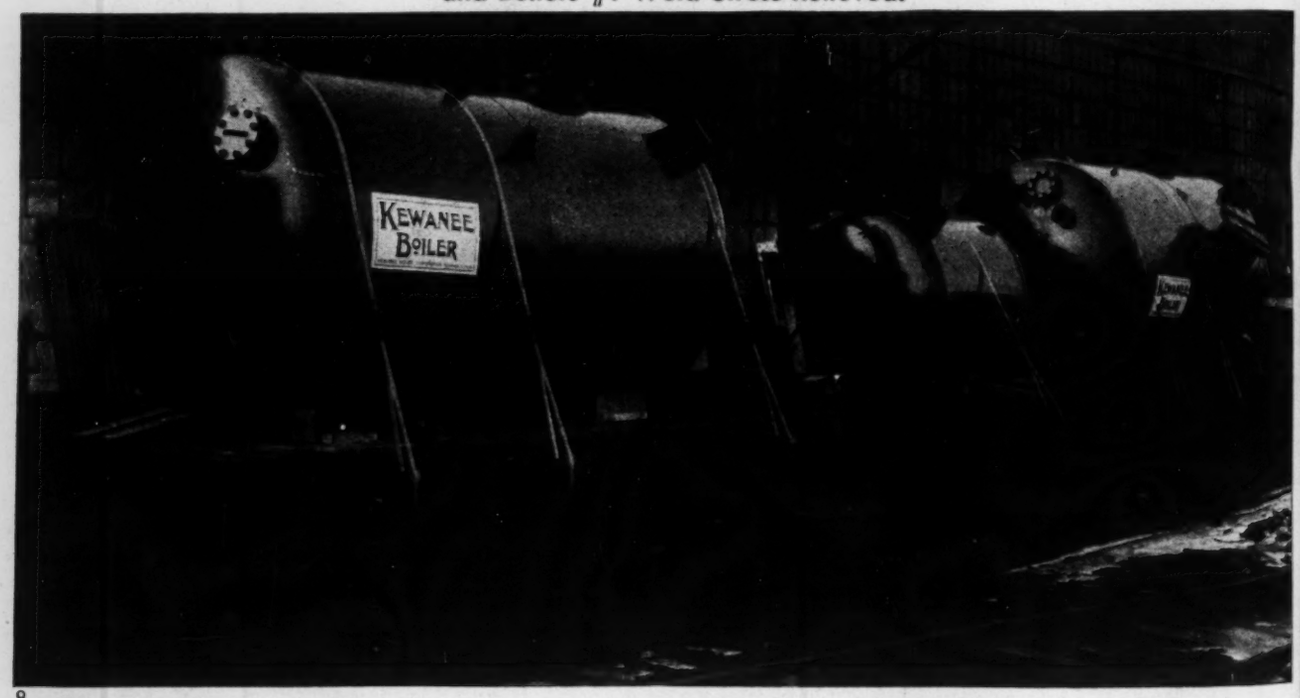
KEWANEE

TYPICAL FLATCAR LOADINGS

Special Tanks for the Synthetic Rubber 'Plantations'

Quantity Production; Quality Work; on Time;
all as demanded in the Emergency Rubber Program

Kewanee is equipped for Riveted Fabrication, large and small. For Hand Welding Low Pressure Boilers & Tanks; or Latest Automatic Welding and Flame Cutting Equipment available on Pressure Vessels and Boilers #1 Weld Stress Relieved.



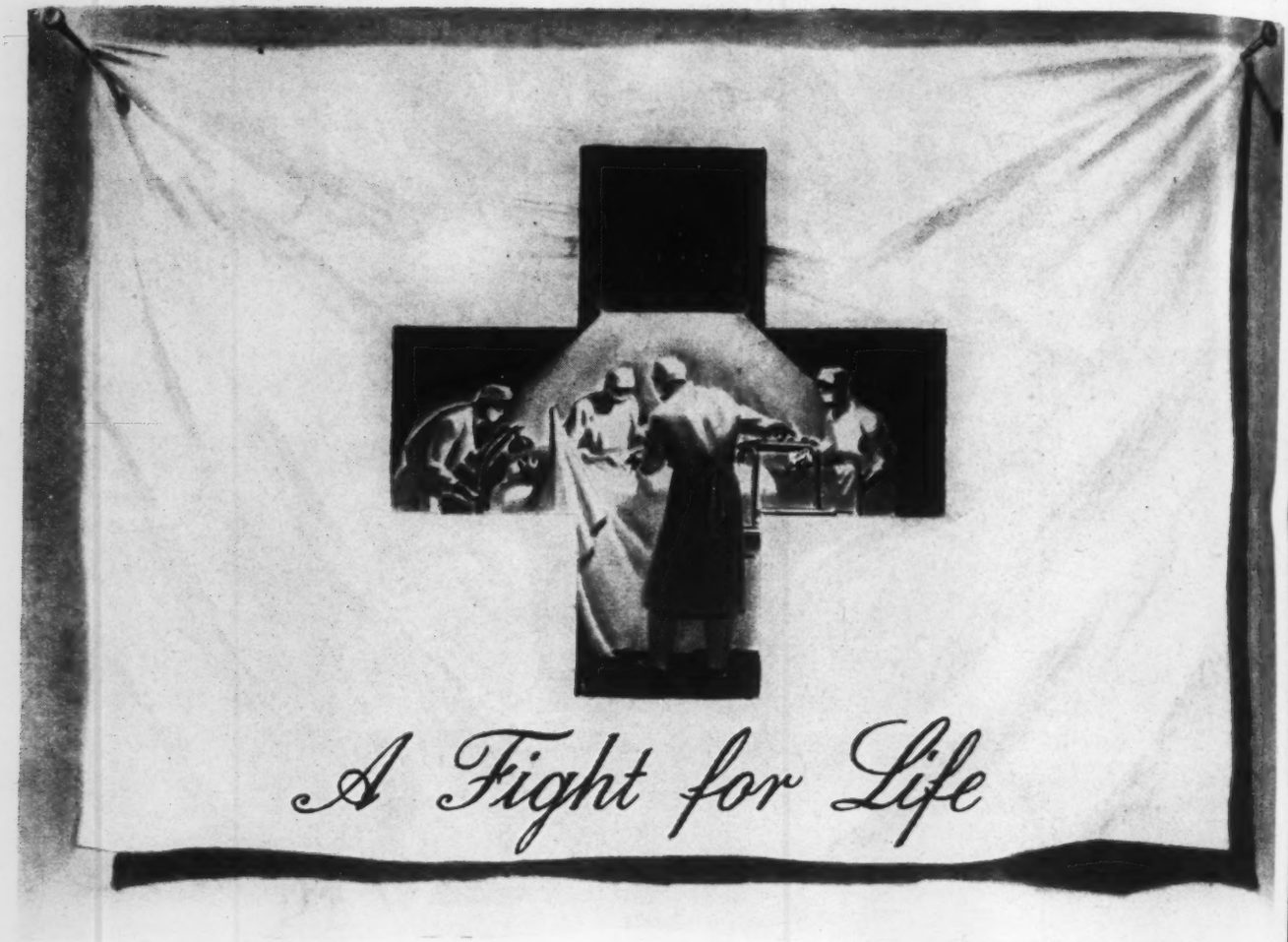
KEWANEE BOILER CORPORATION
KEWANEE, ILLINOIS
Branches in 60 Cities—Eastern District Office: 40 West 40th Street, New York City 18
Division of AMERICAN Radiator and "Standard" Sanitary Corporation

Just what the Doctor Ordered

FOR WARTIME HEATING

Today's boilers have a big wartime responsibility! They MUST keep heating plants going now without let-up or break-down! Moreover, acute shortages of ALL fuels demand maximum efficiency from present systems. Now, more than ever before, you need these dependable "X" Products. They have been keeping old boilers young and healthy for 25 years.

"X" LABORATORIES, INC., 25 WEST 45th ST., NEW YORK



A Fight for Life

Working tirelessly, day and night, to save the lives of our wounded soldiers and sailors, stand the Army and Navy doctors and hospital attendants. To aid the wounded and maimed in their fight for life, and to help doctors and nurses to withstand the terrific strain of their arduous duties, operating, X-ray and recovery rooms on land and sea are kept comfortable with air conditioning. And refrigeration stands guard over vital serums, perishable medicines and blood. Without these, no amount of effort and devotion to duty would save so many of our fighting men.

Many thousands of Detroit Expansion Valves, Solenoid Valves, Controls and Contact Makers are in use in this life-giving service.

The reputation gained by Detroit refrigeration equipment in peacetime is being heightened by its performance in time of war.

The reliability of "Detroit" and "DL" Refrigeration Products assures the best possible results from refrigeration and air conditioning. If you have need for refrigeration equipment, specify "Detroit" for unfailing performance.

DETROIT LUBRICATOR COMPANY *General Offices:* **DETROIT 8, MICHIGAN**

Division of American Radiator and "Standard" Sanitary Corporation

Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"DL" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • Radiator Valves and Balancing Fittings • Arco-Detroit Air and Vent Valves • "Detroit" Expansion Valves and Refrigeration Accessories • Air Filters • Stationary and Locomotive Lubricators

. . . Glad to send you this useful chart

This 12″ x 9½″ chart originally was prepared to give new men in industry a quick way to classify valves • Classify valves by type; identify them by outward appearance; appreciate the services for which each type is suited; explain the broad principles on which valves operate, classify valves as to use and show the symbols by which each type is indicated on piping layouts • Experienced men, seeing these charts, also have asked for one for their own use. So we have printed a quantity in two colors on heavy cardboard—convenient for wall tack-up or filing.

Glad to send you a copy. Address our offices in Reading, Pennsylvania.

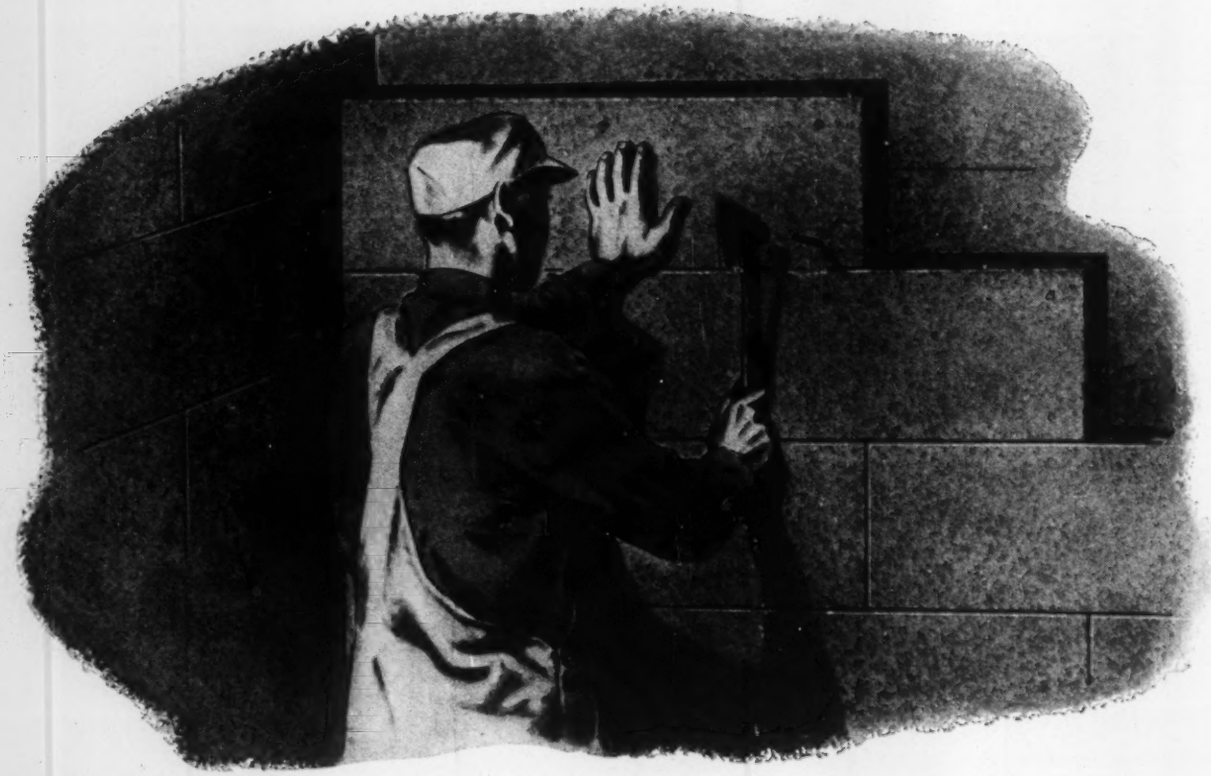
READING-PRATT & CADY

MANUFACTURERS OF

READING CAST STEEL VALVES AND FITTINGS • PRATT & CADY BRASS AND IRON VALVES
D'ESTE VALVE AND ENGINEERING SPECIALTIES

Reading, Pa., Atlanta, Boston, Chicago, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco

A DIVISION OF **AMERICAN CHAIN & CABLE COMPANY, Inc., BRIDGEPORT • CONNECTICUT**



ERECTION *know-how*

an important Armstrong EXTRA

TWO THINGS make for lasting efficiency on any low-temperature insulation job . . . the efficiency of the insulating material itself, and the skill with which that material is erected. You get both when you specify "insulation by Armstrong."

At "Insulation Headquarters" you have a complete range of efficient materials to choose from—Armstrong's Corkboard and Cork Covering, Foamglas, and Mineral Wool Board. Thus you can be sure that Armstrong's engineers will specify the material best suited to your needs. Their recommendations will be sound because they have a background of over 40 years' experience in low-temperature insulation work.

The all-important extra you get is the complete follow-through that Armstrong provides *after* you've chosen a material. This is possible first, because Armstrong has offices and distributors spotted in strategic locations all over the country, and second, because all of these offices maintain complete crews of skilled mechanics who are specialists in erecting low-temperature insulation.

These experts have the know-how needed to meet any unusual problem of construction encountered on the job. When they erect insulation you can be *sure* the job is right—sure that it will deliver efficient, lasting service.

Remember this plus value the next time you consider insulation and bring your problems to "Insulation Headquarters." But don't wait until then to get the facts about Armstrong's Insulation. Write today! Armstrong Cork Company, Building Materials Division, 4412 Concord Street, Lancaster, Pennsylvania.

ARMSTRONG CORK COMPANY

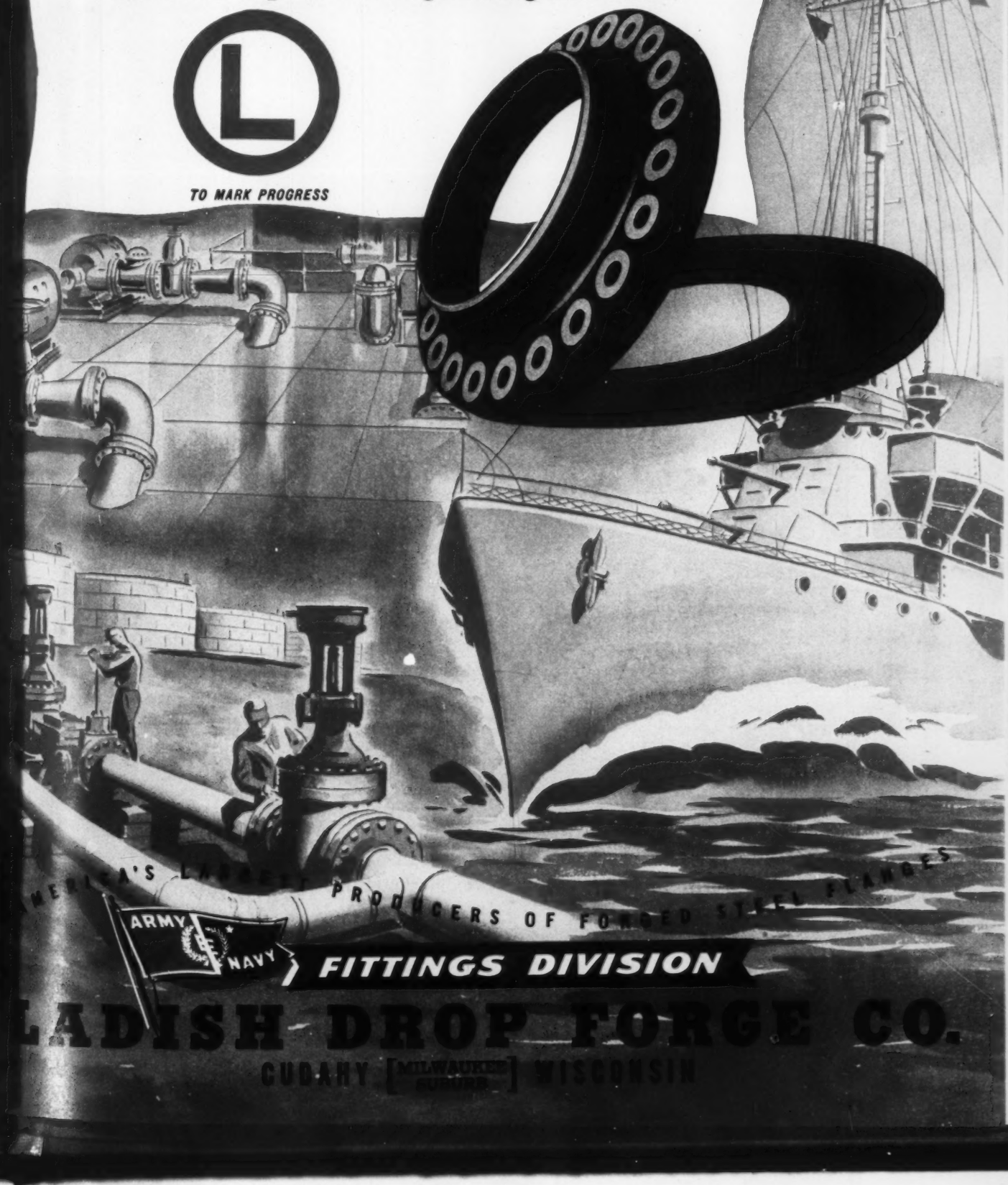
Insulation Ⓐ Headquarters

LADISH

forged steel flanges

Connecting the vital arteries of Industry, Ladish flanges are produced under the highest metallurgical and engineering standards.

TO MARK PROGRESS



AMERICA'S LARGEST PRODUCERS OF FORGED STEEL FLANGES

ARMY NAVY

FITTINGS DIVISION

LADISH DROP FORGE CO.

CUDAHY [MILWAUKEE SUBURB] WISCONSIN

do it...but quickly:

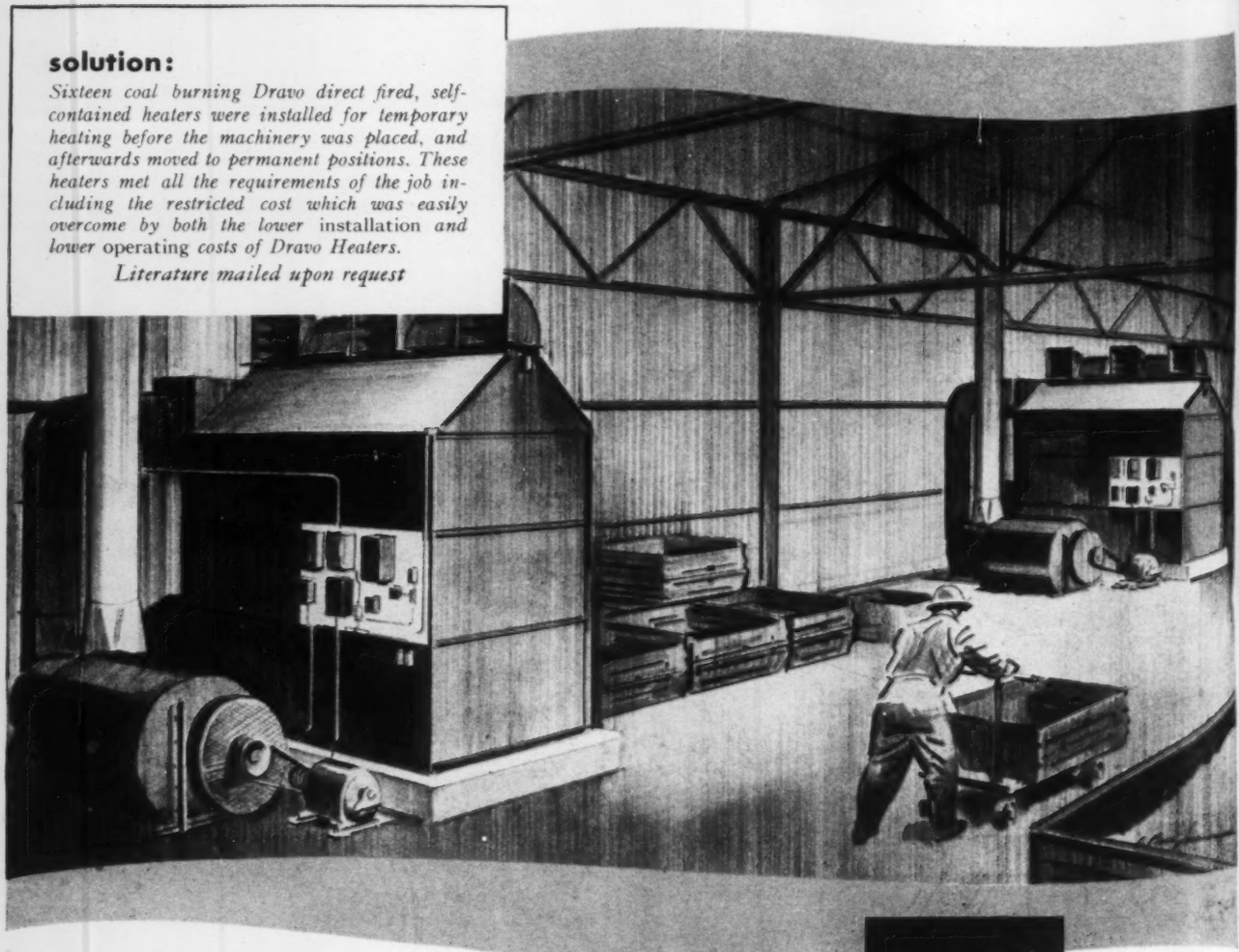
Take a group of Tobacco Warehouses . . . furnish 25,000,000 B. t. u. . . . to facilitate precision machinery work

Several old tobacco warehouses were considered for conversion to the manufacture of precision aluminum aircraft castings. The buildings, varying in size, were light structures without insulation and were widely separated. No oil or gas was available. Heat was required to provide comfortable temperatures for personnel and to eliminate expansion and contraction in the castings. Heat had to be made available before the machinery was installed. A system sufficiently flexible to meet these conditions had to be found, and in addition the rehabilitation contract set an extremely low cost for installation and operation of the heating system.

solution:

Sixteen coal burning Dravo direct fired, self-contained heaters were installed for temporary heating before the machinery was placed, and afterwards moved to permanent positions. These heaters met all the requirements of the job including the restricted cost which was easily overcome by both the lower installation *and lower* operating *costs of Dravo Heaters.*

Literature mailed upon request



DRAVO CORPORATION · PITTSBURGH

DRAVO Heating

In the tight spots it's a STAR

AVAILABLE ON REQUEST . . . Handsome full-color 10"x10" reproduction of this great, dramatic painting by an actual eye-witness—Lt. Commander Anton Otto Fischer, the internationally famous marine painter. No advertising matter.

Up came the German sub—the sixth to face the U. S. Coast Guard Cutter *Campbell*, in 18 hours. Seconds later, the U-Boat was reeling under the cutter's withering fire against her steel decks and conning tower, recoiling from the impact of the cutter's starboard side against her pressure hull, floundering helplessly as shell after shell from the *Campbell's* after-guns crashed into her plates. Minutes later, down went the sub for the full count.

Now it was seen that the sub's port hydroplane had ripped through the *Campbell's* hull. Soon the engine room was flooding, the main electrical switchboard swamped. All power failed. The *Campbell* was a drifting, helpless hulk in the night. Could STAR help the *Campbell* through this "tight spot?" Star could — and did. When the main lighting and power systems failed, a Star Auxiliary Generator—installed for just such emergencies—provided light, refrigeration and power for cooking, radio, and other purposes until the *Campbell* reached port.

Thus, in more ways than one, Star proves its worth in the "tight spots." And in the actual "tight spots" of your product, where stamina must be combined with specific space adaptation, you'll find Star's unique welding process ready to fill the bill—without special patterns or special castings.

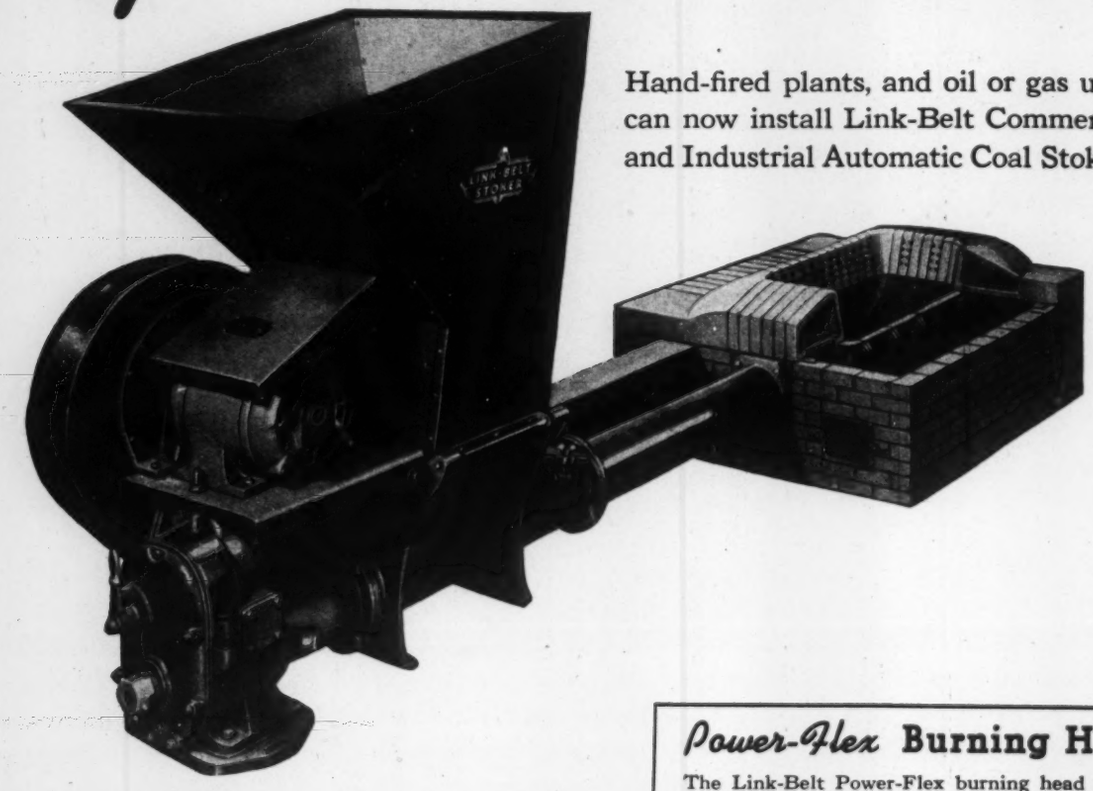
★ STAR ELECTRIC MOTOR CO., Bloomfield, New Jersey ★

POWER **PACKAGED** AS YOU NEED IT

ARMY E NAVY

STAR MOTORS

Why a LINK-BELT *Stoker?*



Hand-fired plants, and oil or gas users can now install Link-Belt Commercial and Industrial Automatic Coal Stokers.

● The company behind the product is very important to the stoker buyer, since it affects the cost of the stoker, its useful life, and service.

Link-Belt Company has been in business for 68 years, and has plants, warehouses and offices throughout the United States and Canada—doing business all over the world.

Link-Belt engineers are world-famous as experts on coal handling equipment design. Improvements are constantly being made . . . Link-Belt prides itself on the belief that every product it sells represents the finest that modern engineering and manufacturing can produce.

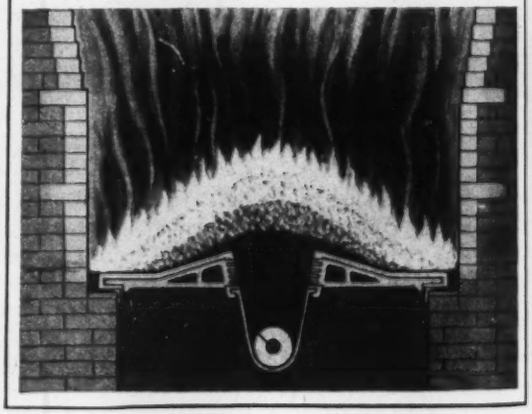
Compare Link-Belt with other stokers as to what you get for your money—feature by feature. Write, wire or phone for copy of Book No. 1970.

LINK-BELT COMPANY

Mfg. Plant and Sales Hdqrs: 2410 W. 18th St., Chicago 8, Ill.
Eastern Sales Hdqrs: 420 Lexington Ave., New York 17, N. Y.

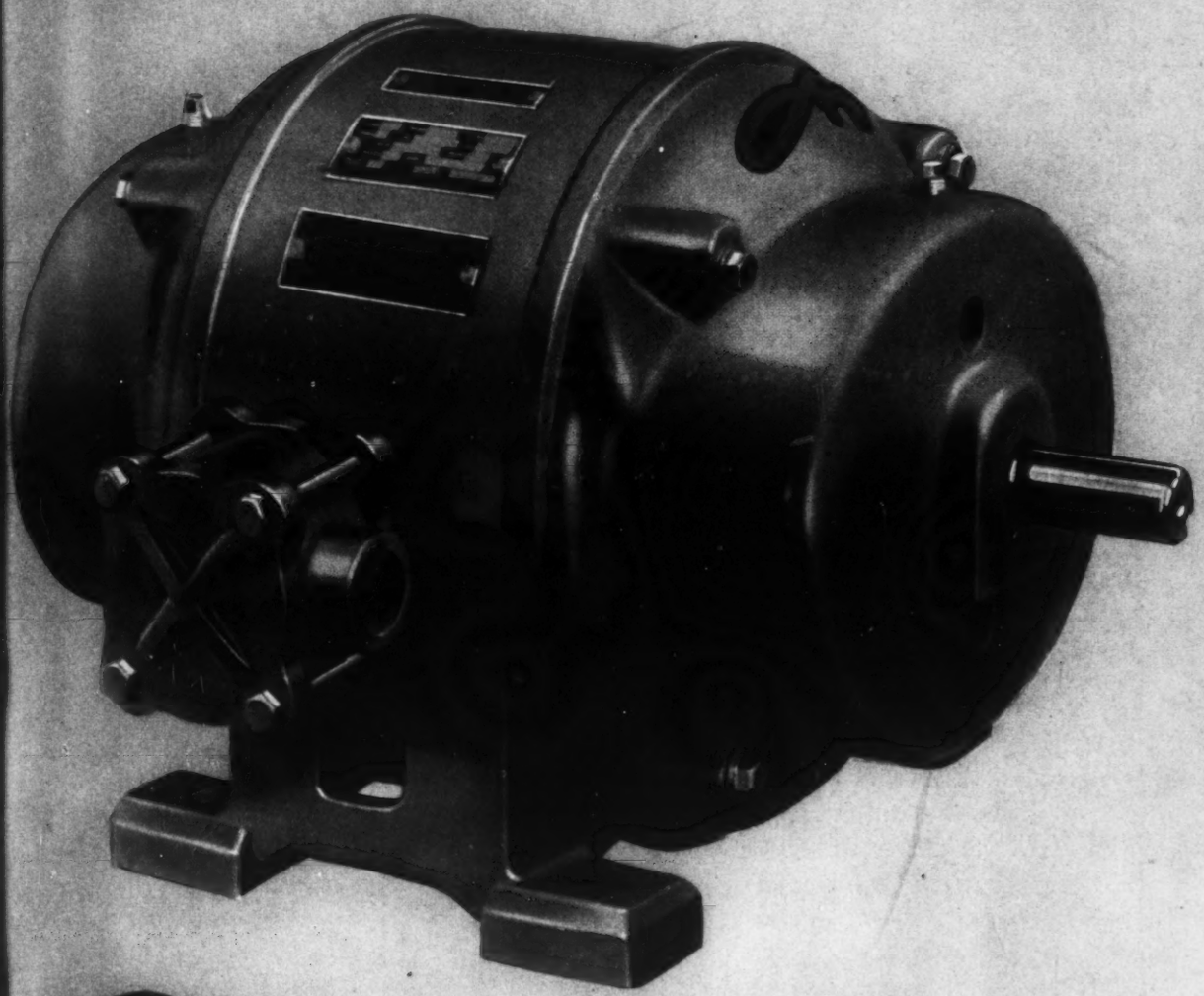
Power-Flex Burning Head

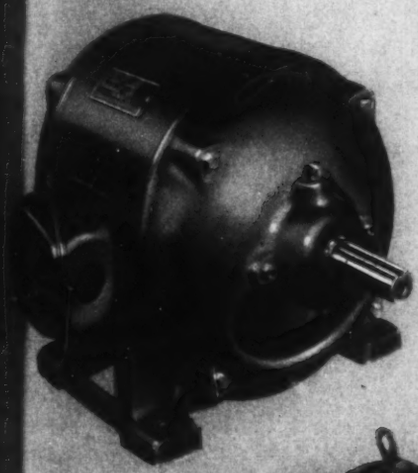
The Link-Belt Power-Flex burning head has no dead plates, the laminated tuyeres extend to the sides of the furnace. This places three to four times as much tuyere area in contact with air as does the conventional dead plate and tuyere type arrangement, with elimination of warping and excessive maintenance cost. Secondary air improves combustion over the whole fuel bed.

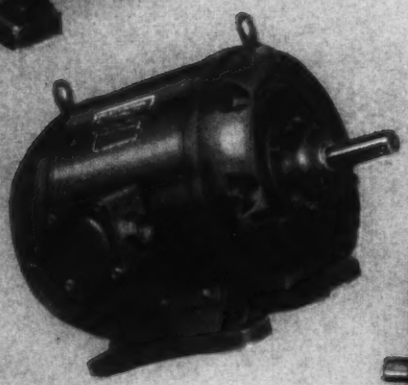


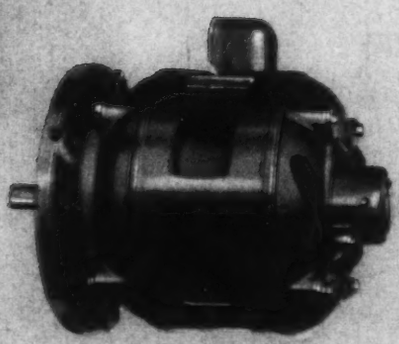
save **FUEL — LABOR — TRANSPORTATION**

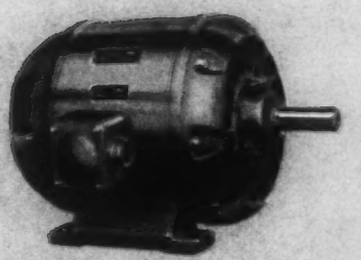
LINK-BELT
AUTOMATIC COAL STOKERS











There is a size and type LOUIS ALLIS electric motor for every industrial requirement.

THE LOUIS ALLIS CO., MILWAUKEE 7, WIS.

Speaking of Electric Motors—

The day of trying to use a standard motor for a special job is about over.

Machinery designers, and production managers have learned that it is much more efficient and economical to obtain a motor with exactly the electrical and mechanical characteristics required to perform a specific job than it is to try to doctor up a standard "shelf" motor to do the job.

Speed and horsepower are no longer the major measuring stick of motor requirements — they are merely incidental to the many other characteristics available in electric motors today.

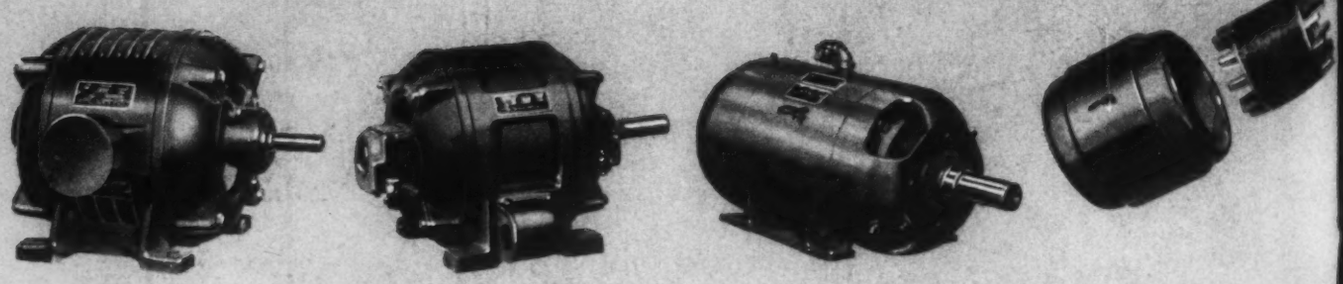
For over forty years we have been developing special motors for special jobs — our engineering department has a wealth of experience along this line —

Right now special Louis Allis motors are serving a major important role in helping your boy and mine win this war — to help bring him back home — safely — and as quickly as possible.

As soon as Uncle Sam does not so urgently need all of our facilities — your electric motor problems and requirements will receive our most prompt and careful attention in every way.

But right now — let's WIN this war!

THE LOUIS ALLIS CO., MILWAUKEE 7, WIS.



IF IT'S PIPING
CONTACT FLORI

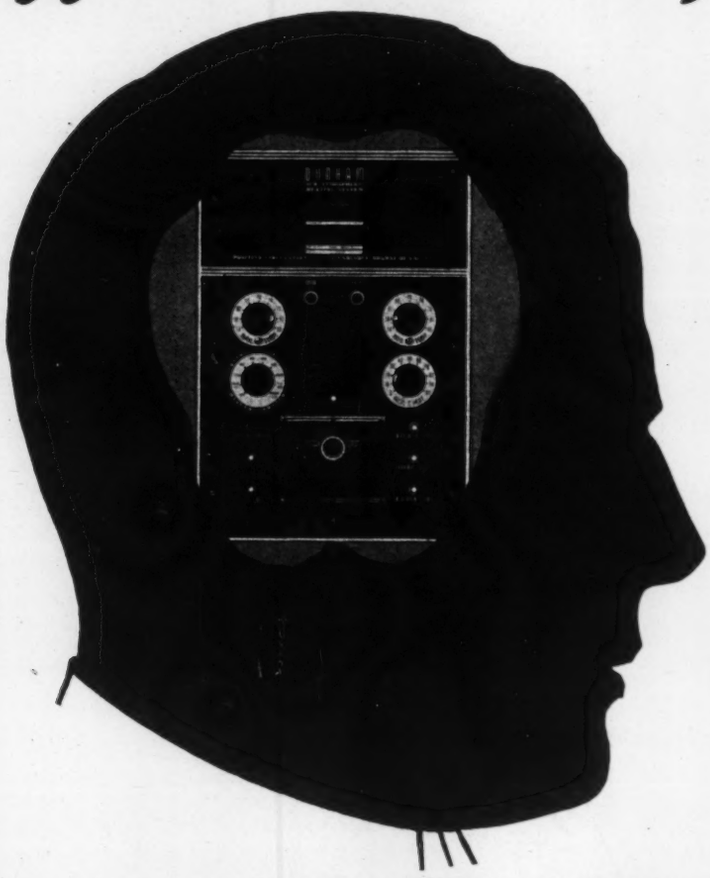
We make anything in tubular or plate steel fabrication: Fabricated Piping —for steam, water, air, oil, gas, chemicals • Random mill or cut lengths, bent, coiled, welded, flanged, threaded • Valves, Pipe Fittings.

Send us your inquiries.

FLORI PIPING

THE FLORI PIPE COMPANY • ST. LOUIS—CHICAGO

The Mechanical Brain of Dunham Differential Heating



Dunham Differential Heating makes Fuels go further

Why not investigate the Dunham System for your properties? We will gladly work with you and your architect. The heating contractor of your choice can do the work. Simply write us.

the DUNHAM SYSTEM OF CENTRALIZED CONTROL

The Human Brain

The brain automatically directs and controls all motion of the body. The thousand and one daily movements of the muscles of the foot, whether in walking, running, dancing or in kicking a football, are directed and effortlessly controlled by the brain. The same is true of the functioning of the hand—whether in writing, lifting, pulling or pushing. In like manner the brain controls each movement of the mouth whether in speaking or eating. This system of centralized control is typical of the centralized control of a Dunham Differential Heating System.

Dunham Differential Heating Is Controlled by a Mechanical Brain

The window-mounted thermometer (Selector) reacts to changing wind and weather conditions. It is coordinated with the Heat Balancer (which measures the heat output of the system) and with the room thermometer (which measures room heat requirements). The Panel (Mechanical Brain) is informed electrically the amount of heat to be distributed in the system to exactly balance the heat-input with the heat-loss of the building.

The Mechanical Brain (*the Panel*) checks steam distribution 180 times every hour—three times a minute—and automatically and promptly controls both the volume and the temperature of the steam admitted to the system. It solves the time-lag problem.

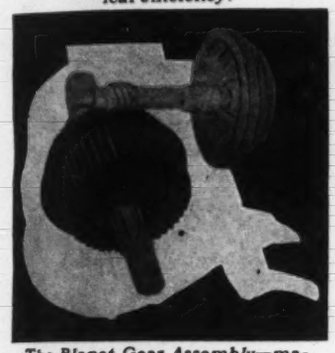
For Victory BUY WAR BONDS and STAMPS

C. A. DUNHAM COMPANY

450 E. OHIO ST. - CHICAGO (11)

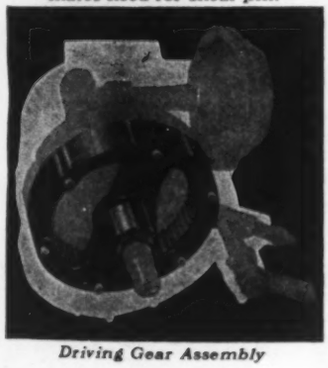
TORONTO, CAN. LONDON, ENG.

The Worm Gear—the helix angle used obtains maximum mechanical efficiency.

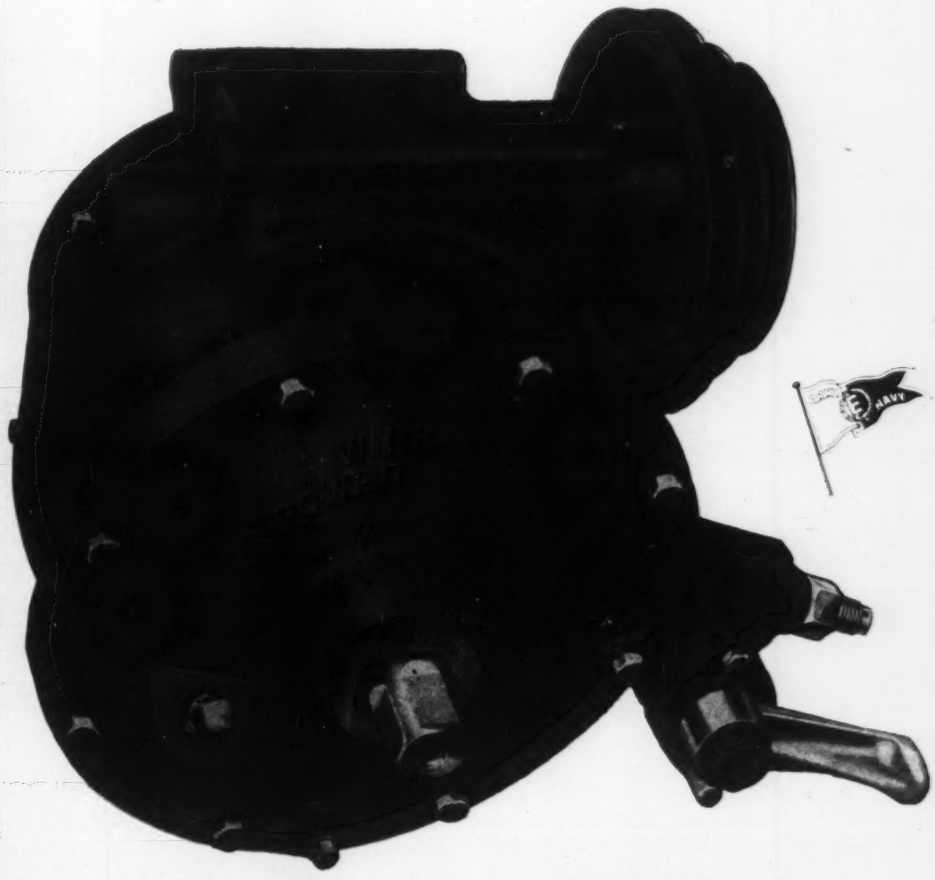


The Planet Gear Assembly—materially reduces tooth-load which ordinarily causes rapid wear.

Back Ring Gear, with Locked Screw Safety Release which eliminates need for shear pin.



Driving Gear Assembly



TAKE IT APART!

...SEE WHY THE WINKLER STOKER HAS THE ONLY FULLY *AUTOMATIC* TRANSMISSION!

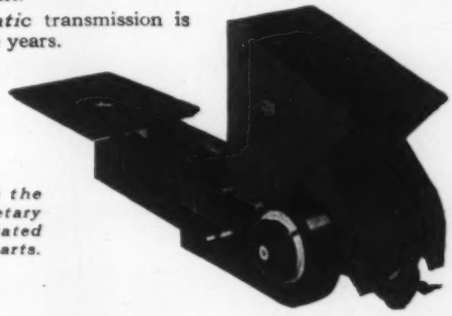
Judgment of a stoker's merit inevitably centers on its transmission. Critical examination and comparison of the Winkler Stoker Transmission will reveal designs and constructions which appeal to your sense of good engineering.

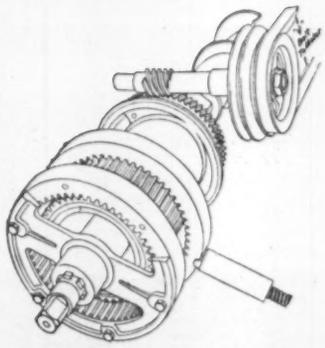
You will see how the mechanical advantages of internal *planetary gearing* are employed to develop a smooth flow of extraordinary power. The practical value of *extra power* is made evident by the fact that the Winkler Stoker is not stalled by, but *crushes* the usual obstructions which may occur in the coal pile.

NO SHEAR PIN!

Uncrushable or metallic obstructions are handled by the Winkler Safety Release—an exclusive feature built into the Transmission. This device automatically and continuously disengages the motor from the transmission and resets it again until the blocking object is removed. Both motor and mechanism are thus protected against overload *without need for a shear pin!*

This *fully automatic* transmission is guaranteed for three years.





This sketch shows the Winkler Inter-planetary Transmission separated into its component parts.

FREE BOOKLET

The Winkler Engineering Department has published an interesting brochure on the mechanics of inter-planetary gearing as applied to Winkler Stokers. Your request for a copy will be promptly honored.

WINKLER

fully automatic STOKERS

U. S. MACHINE CORPORATION, LEBANON, INDIANA

Ready Now!

NEW TRAINING AIDS FOR PIPING MEN

❶ "PIPING POINTERS" SOUND FILM

❷ "PIPING POINTERS" MANUAL

FACTS ABOUT THESE NEW CRANE SERVICES

The "Piping Pointers" film is 16 mm. size with sound track. Approximate showing time, 30 minutes. Available free for showing in any plant, trade school, or industrial training center. The "Piping Pointers" manual is supplied free for all viewers of the film.

ARE your piping maintenance trainees learning fast enough to replace skilled men gone to war? Can they assure your plant of dependable piping service while replacement materials are far from plentiful?

Training of workers is made faster and doubly effective by these new Crane "Piping Pointers" services. Each complements the other in teaching the fundamentals of piping and proper care of valves and fittings to keep up pipe-line efficiency.

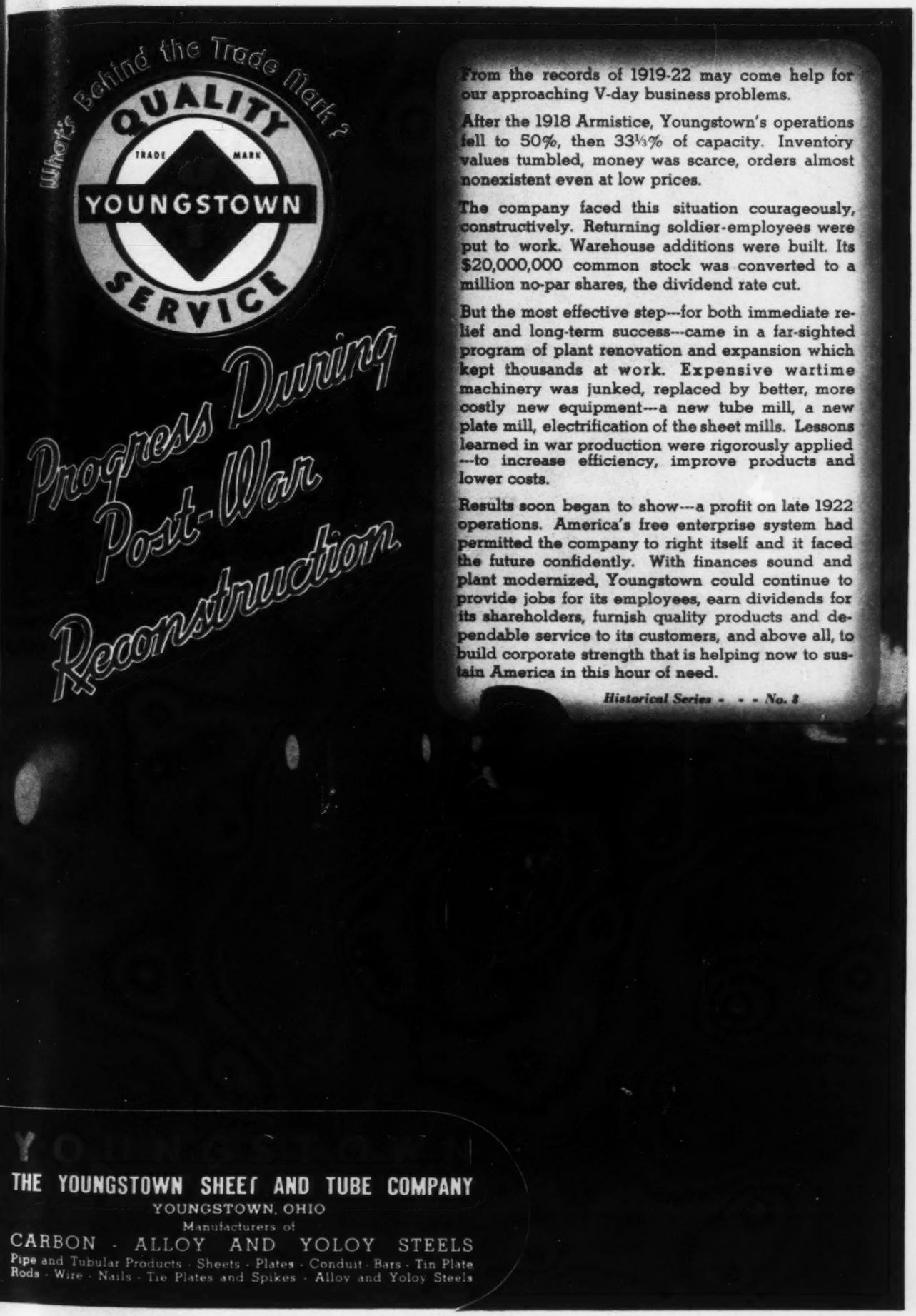
The "Piping Pointers" Manual is the most complete service of its type ever compiled, its chapters ranging from "The Language of Piping" to "Playing Safe on the Job." In the film, trainees see and hear how the manual's content is actually applied.

Available Free to Any Plant

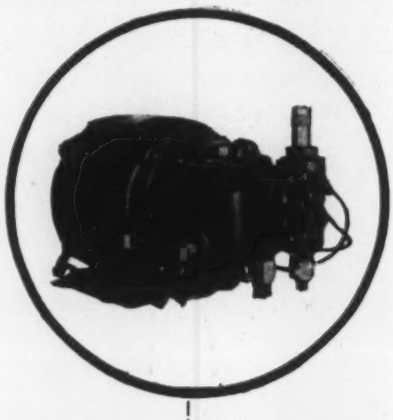
Full information about these services and suggestions for using them most profitably are available on request from your local Crane Representative. Consult him regarding manuals for your piping crews, and showings of the "Piping Pointers" film in your plant.

Crane Co., General Offices: 836 S. Michigan Ave., Chicago 5, Ill.

CRANE VALVES


What's Behind the Trade Mark?
QUALITY
TRADE MARK
YOUNGSTOWN
SERVICE
Progress During Post-War Reconstruction
From the records of 1919-22 may come help for our approaching V-day business problems.
After the 1918 Armistice, Youngstown's operations fell to 50%, then 33⅓% of capacity. Inventory values tumbled, money was scarce, orders almost nonexistent even at low prices.
The company faced this situation courageously, constructively. Returning soldier-employees were put to work. Warehouse additions were built. Its $20,000,000 common stock was converted to a million no-par shares, the dividend rate cut.
But the most effective step---for both immediate relief and long-term success---came in a far-sighted program of plant renovation and expansion which kept thousands at work. Expensive wartime machinery was junked, replaced by better, more costly new equipment---a new tube mill, a new plate mill, electrification of the sheet mills. Lessons learned in war production were rigorously applied ---to increase efficiency, improve products and lower costs.
Results soon began to show---a profit on late 1922 operations. America's free enterprise system had permitted the company to right itself and it faced the future confidently. With finances sound and plant modernized, Youngstown could continue to provide jobs for its employees, earn dividends for its shareholders, furnish quality products and dependable service to its customers, and above all, to build corporate strength that is helping now to sustain America in this hour of need.
Historical Series - - - No. 8
THE YOUNGSTOWN SHEET AND TUBE COMPANY
YOUNGSTOWN, OHIO
Manufacturers of
CARBON - ALLOY AND YOLOY STEELS
Pipe and Tubular Products - Sheets - Plates - Conduit - Bars - Tin Plate
Rods - Wire - Nails - Tie Plates and Spikes - Alloy and Yoloy Steels

*SPECIAL MOTORS DESIGNED
TO FIT THE APPLICATION



EXTREME QUIETNESS AND LONG LIFE

If operating conditions were always the same . . . if there were no differences in types and sizes of the product — there would be no need for special motors. But we know that variables do occur in equipment, such as oil burners, and other electric motor operated apparatus, which require specially designed motors to meet specific performance requirements of compactness, quietness, overload protection and long life. Holtzer-Cabot special motors are meeting the operating conditions in various types of equipment.

Holtzer-Cabot has concentrated its energies in the specialized business of designing and building special fractional HP motors for every purpose. Our engineers, backed by 68 years of motor design, can help you with your motor problems.

THE HOLTZER-CABOT ELECTRIC COMPANY

Designers and Builders of Special Fractional HP Motors and Electrical Apparatus

129 AMORY STREET, BOSTON, MASS. CHICAGO, ILL., NEW YORK, N. Y., PHILADELPHIA, PA.

FOR MAXIMUM PERFORMANCE AND MINIMUM MAINTENANCE

Each McAlear Control is a precision instrument—expertly engineered for ONE JOB and ONE SET of working conditions.

INFINITE CARE is exercised in its production. Machining operations are held to critical tolerances for leak proof surfaces and trouble-free mechanisms.

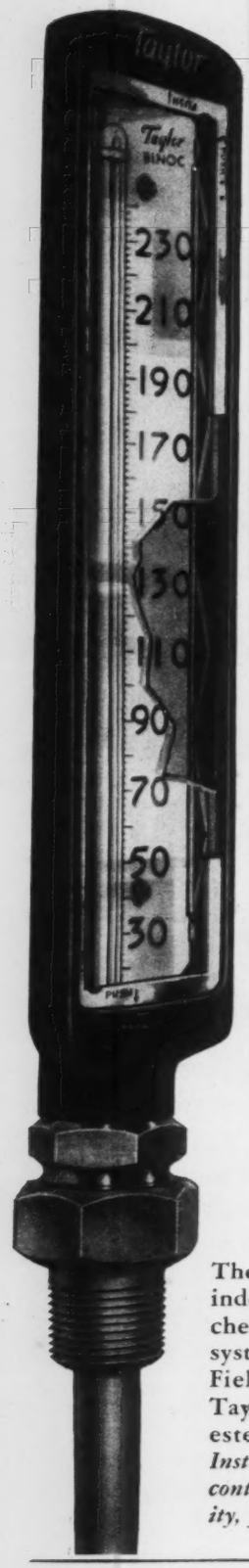
There are 500 McAlear Controls for regulating pressure, temperature and fluid transport. Every one constitutes effective insurance against control failure resulting in plant-paralyzing downtime.

When unusual working conditions require a special control for steam, water, air, chemicals, oil or gas, McAlear will develop it for you.

IF YOU HAVE A CONTROL PROBLEM... call on McAlear engineers. Draw on their fund of experience, on their ability and readiness to help you, whether for wartime application or post war planning. For informative bulletins and catalog, write McAlear Manufacturing Company, 1921 S. Western Ave., Chicago 8, Illinois.

DEPEND ON McALEAR AND YOU CAN
DEPEND ON YOUR INSTALLATION

Have you seen Taylor's NEW Industrial Thermometer?



1. **THE ONE-PIECE CASE** is practically fumeproof. Nothing to work loose. Shallower case makes easier reading through a wider angle of vision.

2. **INTERLOCKING BEZEL,** chromium-plated to resist corrosion, holds thick protective glass front against four wavy tension springs. The case itself is grooved to hold bezel in place securely.

3. **TENSION SPRINGS** are held in position by spring plates fastened under the scale by shakeproof screws. A rigid construction—rattleproof—dustproof. Ideal construction to withstand vibration.

4. **CLEAR THICK GLASS** is used on all Taylor Industrial Thermometers to give maximum legibility and maximum protection to the thermometer tube.

5. **EASY READING BINOC TUBE . . .** All Taylor Thermometers with ranges up to 750°F. are equipped with triple-lens Binoc tubing which is now better than ever. The mercury column stands out vividly through a wide angle of vision. Binoc is a patented feature, exclusive with Taylor Instruments. Easy reading Binoc invites frequent reading.

6. **BOLD, EASY READING SCALE** stands out clearly against a sharply contrasting background.

7. **MANY STANDARD RANGES** within the limits of minus 40° and plus 950°F.

8. **WIDE VARIETY** of stem constructions available.

9. **PERMANENT TAYLOR ACCURACY . . .** Glass tubes are heat treated to remove strain, which greatly reduces breakage—and artificially aged to prevent calibration change later. Tubing has sufficient test points to assure accuracy over entire range. Scale is *individually graduated* for each tube.

These thermometers are not only used independently but also serve as a basic check on accuracy of bimetallic or tube system thermometers. Ask your Taylor Field Engineer for full information. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. *Instruments for indicating, recording, and controlling temperature, pressure, humidity, flow and liquid level.*

ARMY NAVY

Taylor Instruments

MEAN

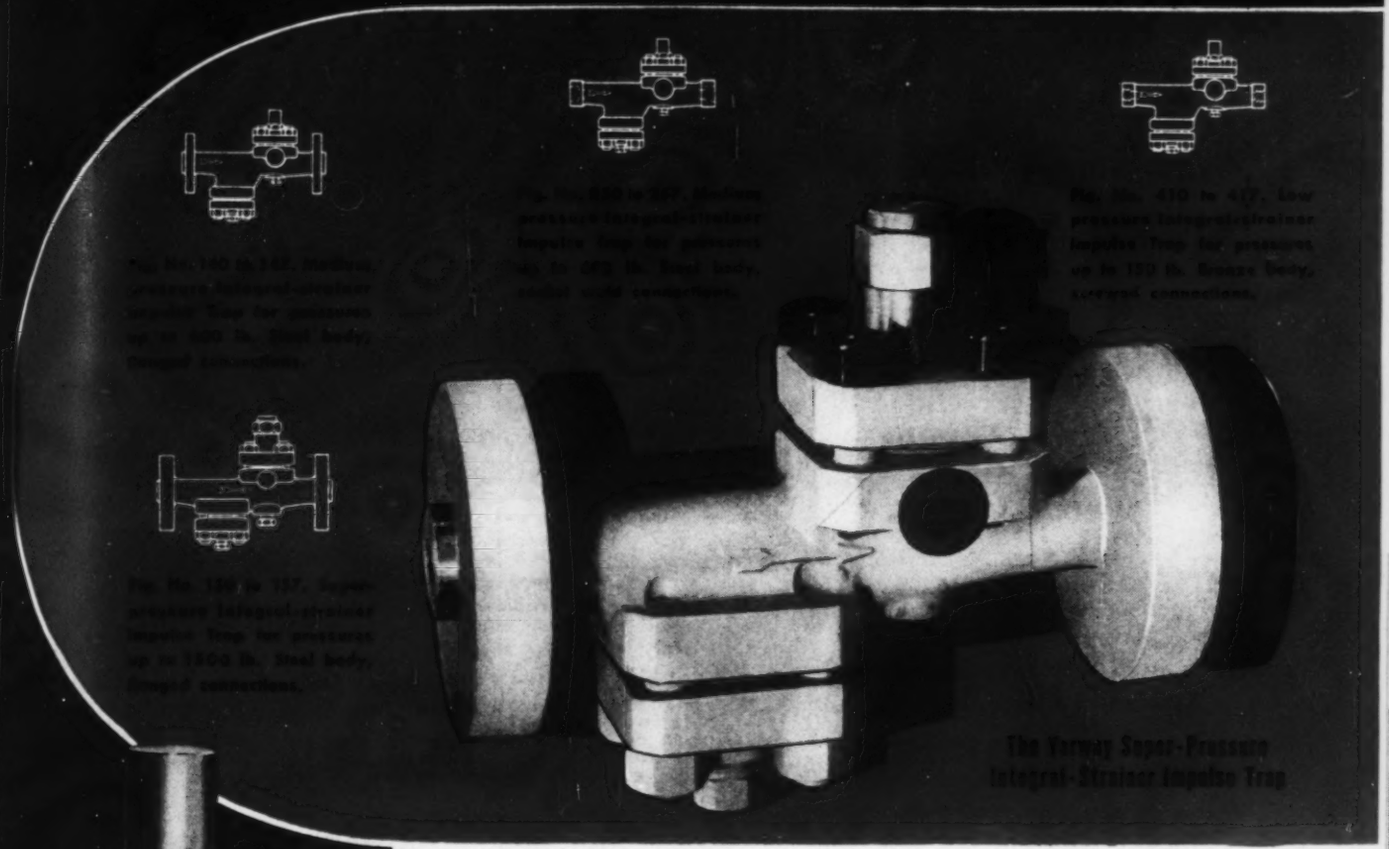
ACCURACY FIRST

IN HOME AND INDUSTRY

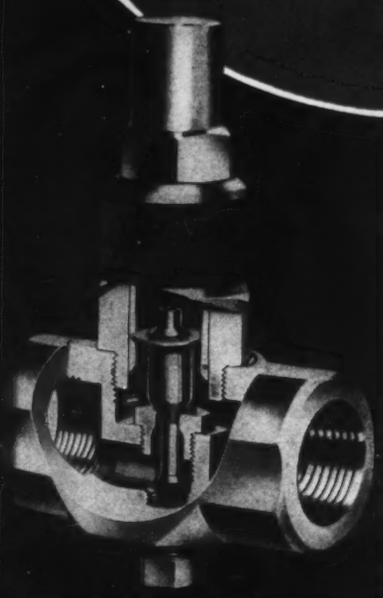
★ KEEP ON BUYING U. S. WAR BONDS AND STAMPS ★

Yarway Impulse Traps

For Pressures Up to 1500 lbs



The Yarway Super-Pressure Integral-Strainer Impulse Trap



The Standard Yarway Impulse Trap. Note only one moving part — a little valve.

ALONG with the remarkable success of the YARWAY IMPULSE TRAP for standard trapping service (more than 250,000 have been purchased), has come its use in steam plants where pressures as high as 1500 lbs and temperatures as great as 900°F are encountered.

The integral-strainer trap shown above, developed for this service is suitable for every drainage requirement in high pressure steam installations. It has ample condensate capacity when system is being "warmed up". It will handle relatively small amounts of high temperature condensate, efficiently, without losing its prime.

The valve closes positively in the presence of dry or superheated steam.

It is a fraction of the size and weight of other type traps designed for the same service—saving space, simplifying installation and requiring no support.

It is suitable for all pressures within a wide range without change of valve or seat.

It has the same simplicity of design as does the standard Impulse Trap—only one moving part, a little valve.

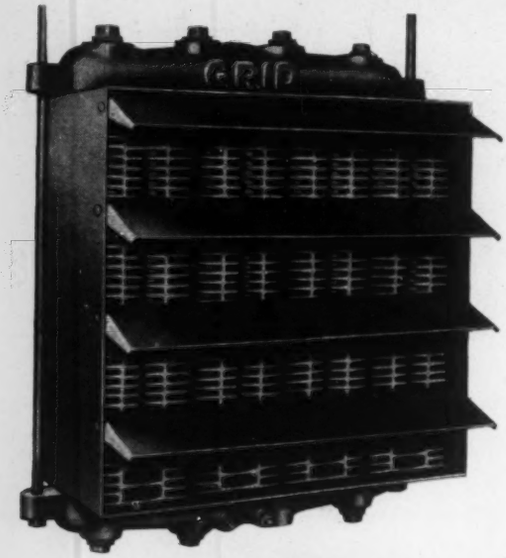
Its integral-strainer protects the trap against scale and rust in the system.

For complete description of operating principle, send for Bulletin T-1738.

YARNALL-WARING COMPANY, 107 MERMAID AVE., PHILADELPHIA 18, PA.

YARWAY IMPULSE STEAM TRAP

Install UNIT HEATERS and BLAST SECTIONS



Cast Iron Series GRID Unit Heaters are built to last, not just for the duration, but built to last for years—to last longer than other types of heating equipment. In many installations this means GRID Unit Heaters will last as long as the building itself. They will have the same high efficiency in years to come as the day they were installed.

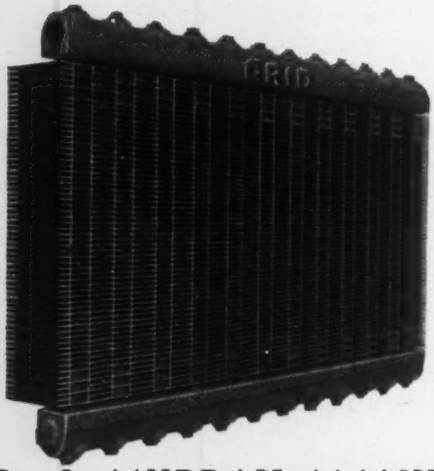
No other unit heater has its lasting qualities. Cast Iron GRID Unit Heaters have the same physical properties as cast iron radiators—and you know how long they last. The "fin" heating sections are made of high test cast iron, to cooperate with the war effort (the standard GRID sections from 1929 to 1942 were made of high test cast iron steam chambers with cast aluminum "fins"). Engineered and tested to operate with either hot water or steam up to 250 lbs. pressure.

that will stand wear as long as the pipes furnishing the steam or hot water to them

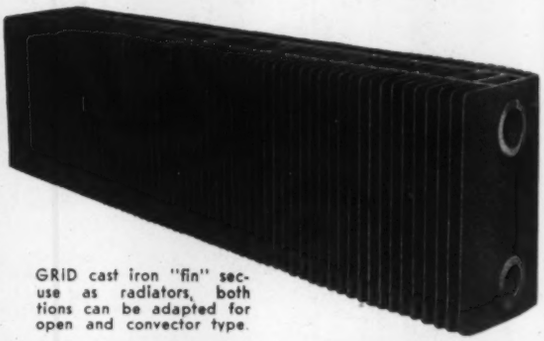
ONE PIECE CONSTRUCTION

NO SOLDERED, BRAZED, WELDED OR EXPANDED CONNECTIONS

GRID condenser "Fin" sections are made in one piece. There's nothing to become loose—nothing to develop leaks or breakdowns—and being made of similar metals there's no electrolysis to cause corrosion, breakdowns or heating failures. So why install a unit heater that will lose its efficiency when used for a short period when you can get GRID for permanency?



GRID Blast sections have the same high efficiency and lasting qualities as GRID Unit Heaters. They are of the same one piece construction as the condenser "Fin" sections and made of high test cast iron. No tortuous air passages, GRID Blast Sections are constructed to permit freedom of expansion with complete absence of ruptures, strains and warping. Compact, they occupy less space than other types of cast iron Blast Coils of equal Capacity. No electrolysis can develop to cause corrosion. GRID open design makes possible easy cleaning. Nothing in the air, such as dust, fumes, lint, etc., can retard their operation. Guaranteed for steam pressures up to 250 lbs. GRID cast iron Blast Sections are ideal for installation where outside air is being brought into the room or building and strong enough to withstand freezing better than any other type of Blast Coils now made for this use.



GRID cast iron "fin" sections can be adapted for use as radiators, both open and convector type.

D. J. MURRAY MANUFACTURING CO.
WAUSAU, WIS.

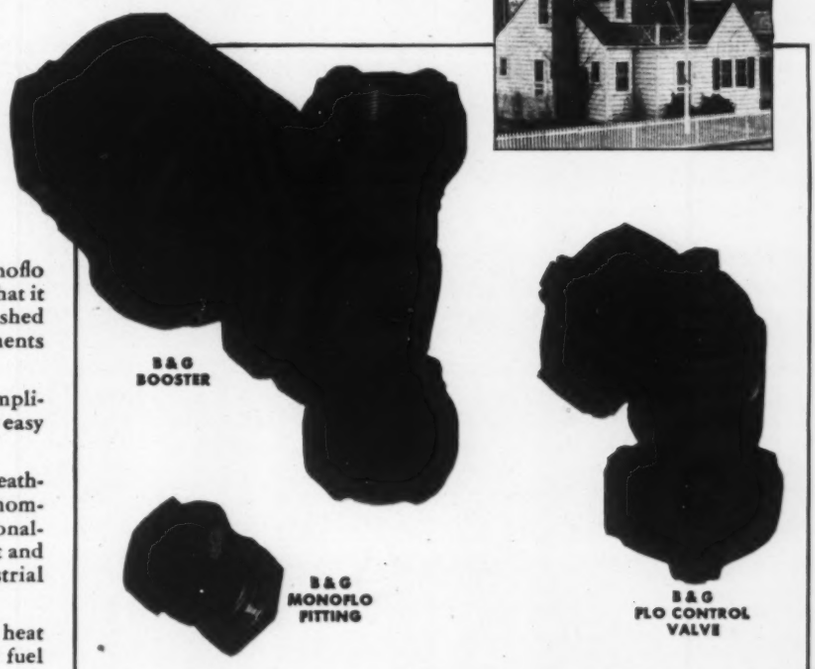
GRID

Offices in Principal Cities

Normandy Village, Union, New Jersey—heated with B & G Monoflo Systems.

A Complete Village HEATED WITH THE SAME SIMPLE EQUIPMENT AS THIS COTTAGE

The B&G Monoflo System is notable for its smooth modulation of temperature without complex control equipment. Its operating parts are fool-proof and dependable. No size limit—installations of over a quarter million sq. ft. are now in operation.



Builders today are specifying the B & G Monoflo Heating System for the common sense reason that it offers *more comfort for less money!* It has established a new heating standard in residences, apartments and industrial buildings because of—

Simplicity of equipment and design. No complicated, expensive control devices—therefore easy to design and dependable in operation.

Greater comfort. Never overheats in mild weather, yet has plenty of reserve when the thermometer hits bottom. Easy zoning permits sectionalized temperature control . . . a great comfort and economy feature in apartments and industrial plants.

Low operating cost. Accurate balancing of heat input and heat loss means that *just enough* fuel is burned—hence economy of operation.

Low installation cost. Small radiators, small pipe and a *single* main instead of two, cut material and labor cost.

B&G HANDBOOK GIVES COMPLETE DESIGN INSTRUCTIONS

Here's a single, authoritative source of information on the design and installation of Forced Hot Water Heating Systems and Service Water Heating Systems. The B & G Handbook presents a simplified outline of instruction, easy to understand and based on accepted engineering practices. Your copy will be sent on request.

B&G MONOFLO SYSTEM

BELL & GOSSETT COMPANY

MORTON GROVE, ILLINOIS *(Suburb of Chicago)*

Canadian Licensee: S. A. Armstrong, Ltd., 115 Dupont St., Toronto

"Buffalo"

TYPE "LL"

LIMIT LOAD FAN

BUFFALO

...the "HEART"...

...of any ventilating system

...WITH A "Buffalo" FAN

...that system is always up to par

...e extensive network of ventilating ducts ...s but little value—until the fan brings it to ...life." That is why the fan you install is so vital ...effective ventilation.

Will that fan get full volume circulation through the entire system, in spite of obstructions?

Will that fan measure up to the demands for 24-hour-a-day operation?

Will that fan serve quietly, with minimum attention and maintenance?

These are practical questions. The improved "Buffalo" Type "LL" Limit Load Fans are the practical answer.

The chart to the right explains why. On the basis of practical, on-the-job tests, these improved "Buffalo" Fans not only measure up to Standard Code Ratings—they deliver when the actual pressure conditions in the system vary from specifications. Here's a development in fan engineering that's changing "ventilation thinking." Let us send you full engineering data *now* on "Buffalo" Type "LL" Limit Load Fans for the "heart" of your ventilating system.

UNDER ACTUAL OPERATING CONDITIONS

The data below is based on a fan outlet velocity of 1600 feet per minute. The obstructions tested represent conditions of actual installations.

Obstruction	Static Pressure	Percent Reduction in Capacity: Buffalo Type "LL"	Percent Reduction in Capacity: Competitive Forward Curve
Elbow on Fan outlet	1"	3	7
	¾"	3	7
	½"	3½	11
Elbow on inlet from left side	1"	2½	8½
	¾"	2	11
	½"	3	17½
Elbow on inlet from right side	1"	1½	5
	¾"	1½	6
	½"	2½	7
Elbow on inlet from top	1"	2½	5
	¾"	2	6
	½"	3	7
Elbow on inlet from bottom	1"	1½	5
	¾"	1½	6
	½"	2½	7

Specify "Buffalo" Fans "First For Fans"

...ORGE COMPANY

...1121 NIAGARA STREET ... BUFFALO, NEW YORK

...Canadian Sirocco Co., Ltd., Kitchener, Ontario

HERMAN NELSON PRODUCTS

in peace and at war

HERMAN NELSON products which were used to heat and ventilate all types of public, commercial and industrial buildings in times of peace are now at war. Since our country started preparations for this war, Herman Nelson Products have been installed in all types of army, navy and war industry projects. They have produced the excellent results and have given the reliable service that they always assured in peace time installations.

In addition, Herman Nelson has been veloping and producing special heat and ventilating equipment for the solut of difficult logistic problems. This eq ment will find new application when av able for civilian use.

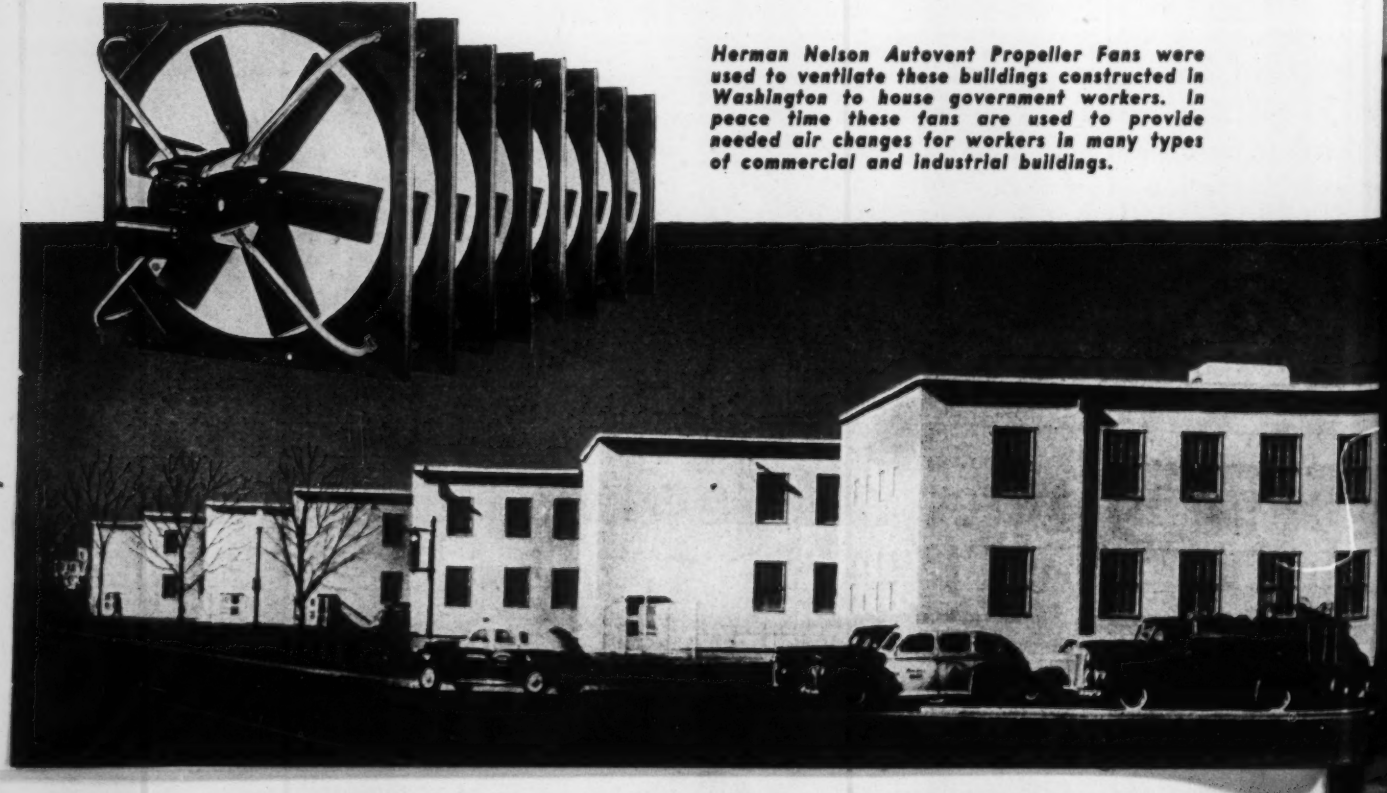
When victory has been achieved, ar tects, engineers and contractors can tinue to look to Herman Nelson progressively designed and well constru heating and ventilating products.

herman nelson

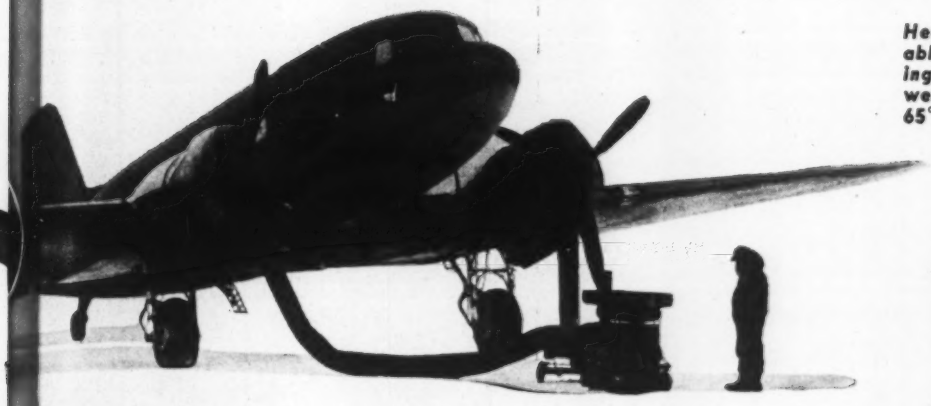
THE HERMAN NELSON CORPORATI

MANUFACTURERS OF QUALITY HEATING, VENTILATING AND AIR CONDITIONING PRO

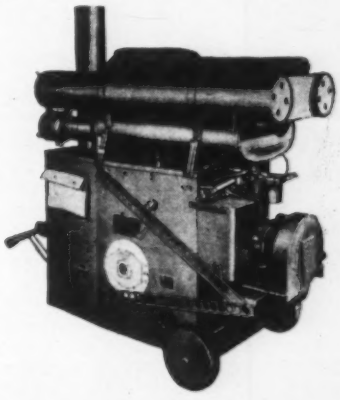
MOLINE, ILLINOIS

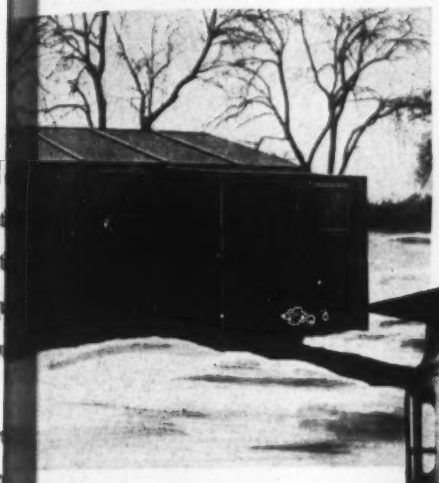


Herman Nelson Autovent Propeller Fans were used to ventilate these buildings constructed in Washington to house government workers. In peace time these fans are used to provide needed air changes for workers in many types of commercial and industrial buildings.

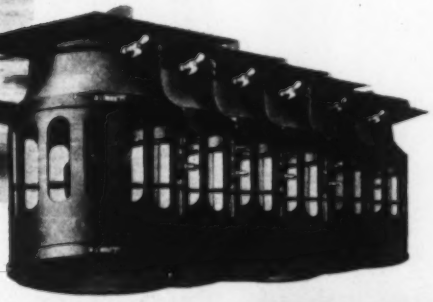


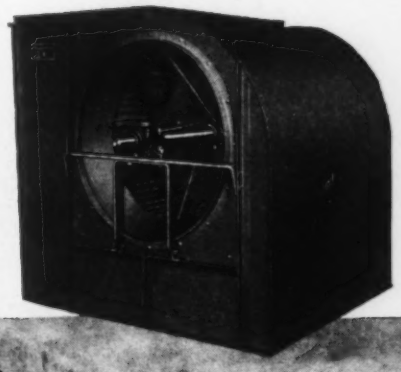
Herman Nelson developed these portable, self-powered heaters for preheating aircraft engines in severe, cold weather with temperatures as low as 65° below zero.



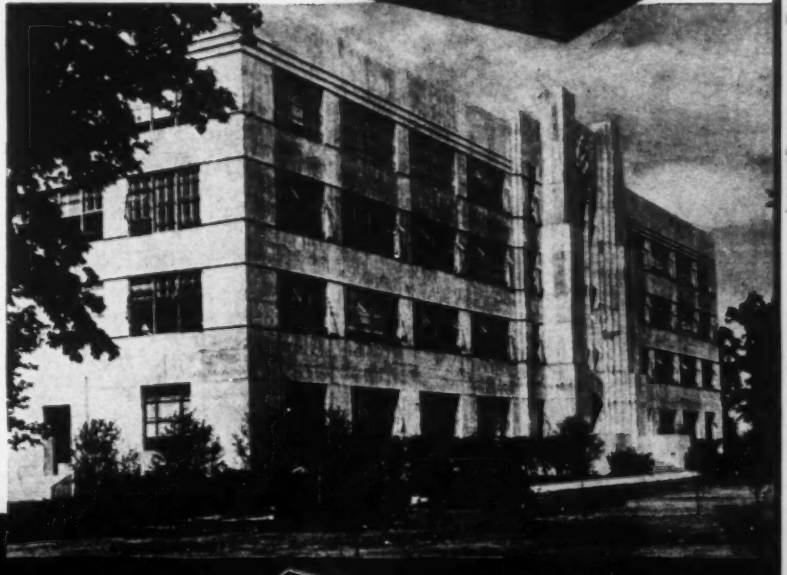


These ventilators were designed by Herman Nelson to overcome stratification in huts used by the armed forces in cold climates.

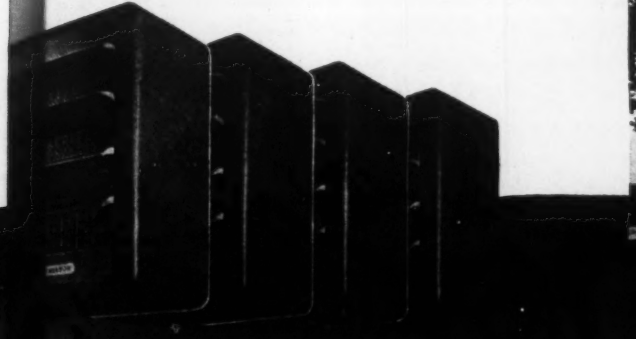




A Herman Nelson Autovent Blower provides ventilation in this Administration Building at one of our government Arsenals. In time of peace these blowers are used not only for ventilation but for many industrial process installations.



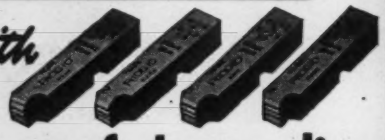
val station recreation building ed with Herman Nelson hiJet eaters. After the war these will provide warmth for recre- space in schools, churches, d similar buildings.



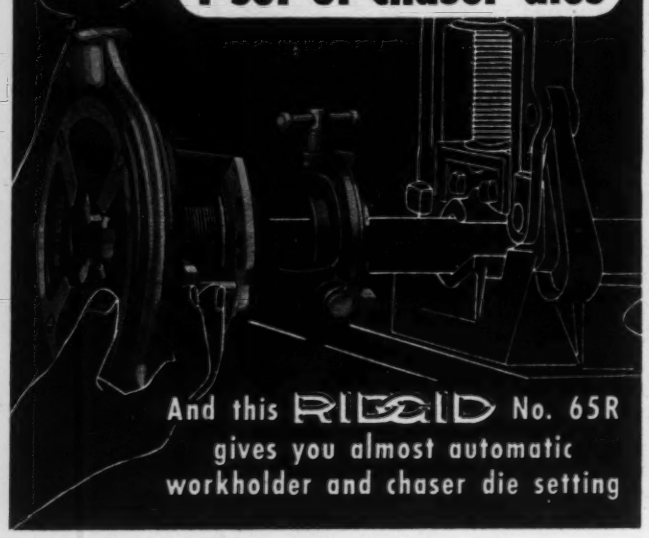
Perfect Threads

on 4 sizes of pipe

with



1 set of chaser dies



And this RIDGID No. 65R gives you almost automatic workholder and chaser die setting

QUARTER TURN CUTTING

New 4 wheel RIDGID CUTTER

For *Faster* pipe cutting in tight places

NO MORE playing tiddly-winks with 16 chaser dies when you want to thread 1", 1¼", 1½" or 2" pipe. Grab your RIDGID No. 65R, trim, efficient, self-contained — set mistake-proof workholder to pipe size instantly (no bushings!), set chaser dies in 10 seconds — you're ready to thread! Feather-light pull cuts smooth perfect threads, any variation, any pipe. High-speed steel dies, rugged steel-and-malleable construction. For better faster threading . . . see it at your Supply House today.

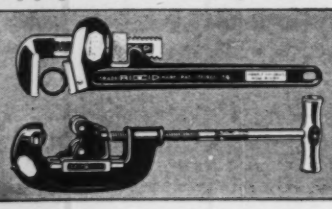
THIS new RIDGID trench-type cutter, with short handle and 4 cutting wheels, goes into tight places and cuts pipe that regular cutters won't touch — all you need is room for a quarter turn. But it cuts any pipe anywhere much faster, so you get time-saving service from it every day. Tough malleable frame holds heavy-duty cutter wheels in perfect alignment, they always cut true. Two sizes: No. 42 to 2", No. 44 to 4" — at your Supply House.

Buy RIDGID Pipe Tools at Supply Houses Everywhere

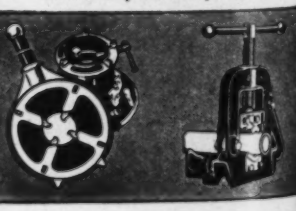
RIDGID

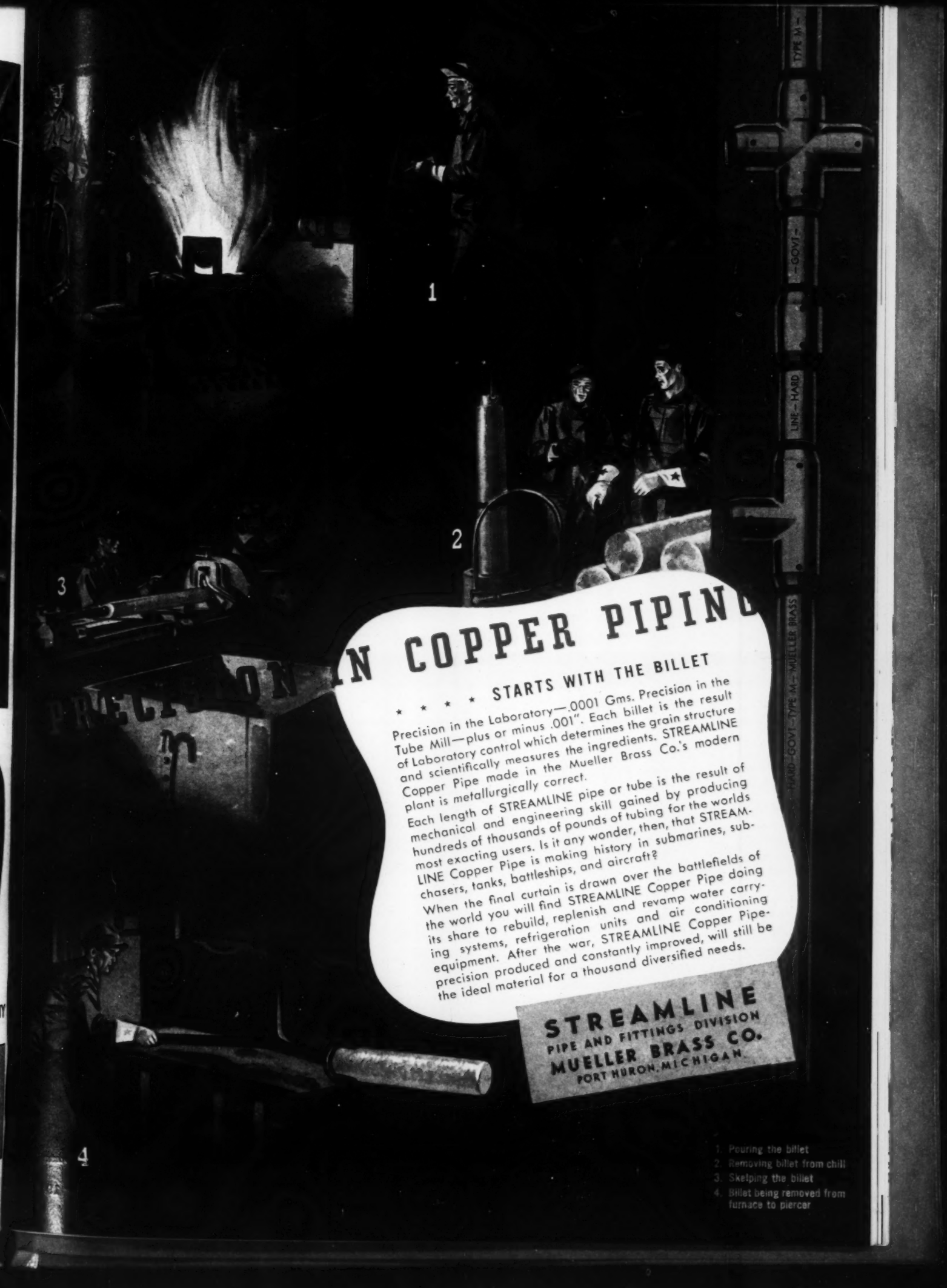
★ PIPE TOOLS ★

THE RIDGE TOOL COMPANY
ELYRIA, OHIO, U.S.A.



Fast-Working Tools for War . . . and the Busy Peace That's Coming




1
2
3
4
N COPPER PIPIN
★ ★ ★ ★ STARTS WITH THE BILLET
Precision in the Laboratory—.0001 Gms. Precision in the Tube Mill—plus or minus .001". Each billet is the result of Laboratory control which determines the grain structure and scientifically measures the ingredients. STREAMLINE Copper Pipe made in the Mueller Brass Co.'s modern plant is metallurgically correct.
Each length of STREAMLINE pipe or tube is the result of mechanical and engineering skill gained by producing hundreds of thousands of pounds of tubing for the worlds most exacting users. Is it any wonder, then, that STREAMLINE Copper Pipe is making history in submarines, subchasers, tanks, battleships, and aircraft?
When the final curtain is drawn over the battlefields of the world you will find STREAMLINE Copper Pipe doing its share to rebuild, replenish and revamp water carrying systems, refrigeration units and air conditioning equipment. After the war, STREAMLINE Copper Pipe—precision produced and constantly improved, will still be the ideal material for a thousand diversified needs.
STREAMLINE
PIPE AND FITTINGS DIVISION
MUELLER BRASS CO.
PORT HURON, MICHIGAN
1. Pouring the billet
2. Removing billet from chill
3. Skelping the billet
4. Billet being removed from furnace to piercer

. . . and drive even harder on the pay-roll savings plan!"

Make War Bonds the Christmas Order of the Day. Urge your workers to make their personal Christmas gifts in the form of War Bonds—and practice what you preach! Make this a 100% War Bond Christmas—to insure future Yuletides of peace and prosperity.

Make up your own posters to spread the "War Bonds for Christmas" story across your plant. Tell the story again and again on bulletin boards, in your plant magazine, and on pay envelope stuffers.

But don't forget your basic, all-important Pay-Roll Savings Plan. How's it going, these days? Perhaps it needs a bit of stoking-up right this very minute, to hold its full head of steam against the competitive demands of the holiday season.

Well, you're the man to stoke it! You can't expect it to keep running indefinitely on last summer's enthusiasm. See to it that your participation percentages, and your deduction percentages, *both* end up the year at new levels.

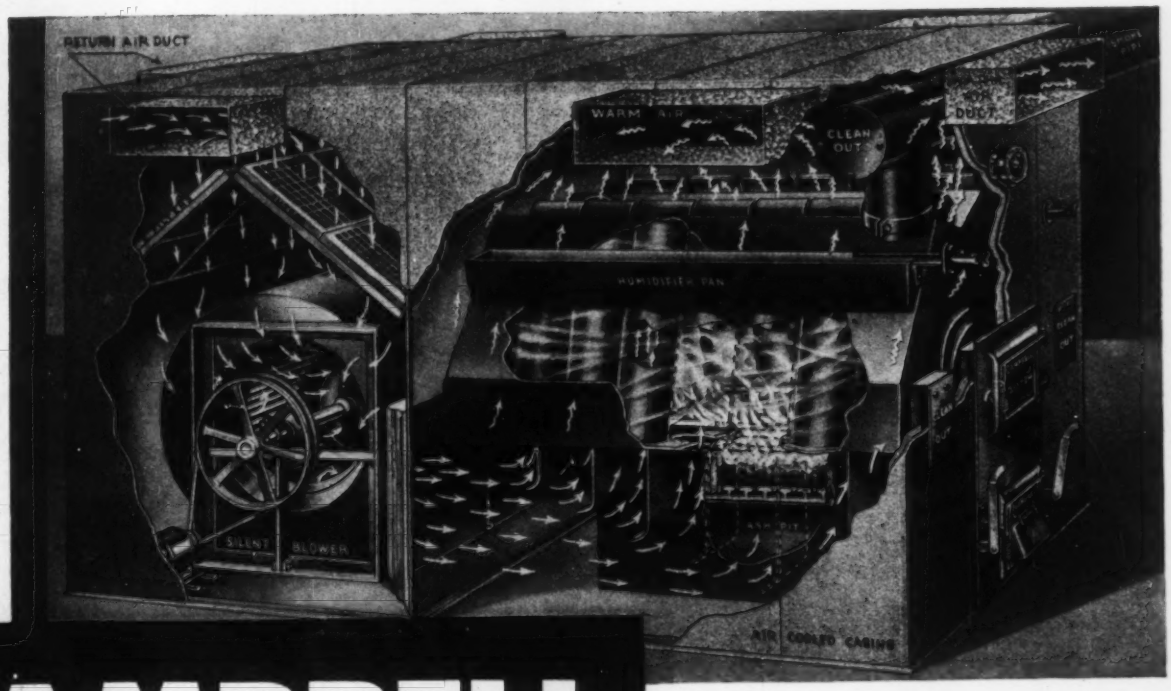
Every month, now your Pay-Roll Savings ought to run well ahead of the preceding month. *For so many families that formerly depended on the earnings of a single worker, now enjoy the combined earnings of several.* Such *family* incomes are doubled, trebled, even multiplied many times.

Now's the time to turn as much as possible of these increased earnings into War Bonds—War Bonds for Christmas . . . and War Bonds the whole year 'round!

GIVE THE PRESENT WITH A FUTURE—WAR BONDS!

This space contributed to Victory by **HEATING PIPING & AIR CONDITIONING**

This advertisement prepared under the auspices of the United States Treasury Department and the War Advertising Council



One-piece, gas-tight, welded construction makes installation easier; assures long, efficient operation.

CAMPBELL
8000 SERIES
HEATERS
for large buildings, industrial plants, etc.

Economical Direct Heat

★ Campbell Heaters are completely self-contained units; moderate in cost; compact and easy to install. Designed for efficient operation with or without ducts, they supply quick, direct heat at extremely low cost. Seven sizes, from 725,000 to 2,160,000 B.t.u.'s per hour, to meet every requirement for large buildings.

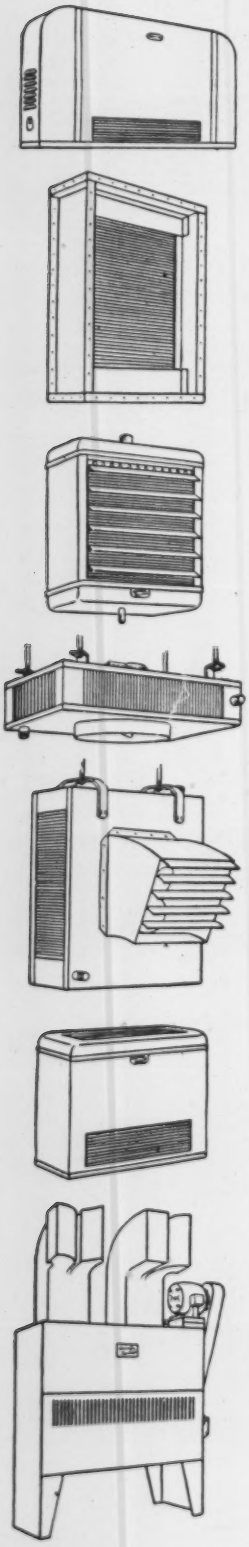
WRITE for complete details. If an estimate is desired, please supply specifications.

Campbell HEATING COMPANY

Des Moines, Iowa

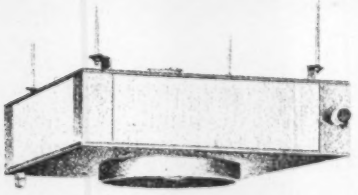
TOMORROW is well on its way!

When days of peace and reconstruction come, remember to specify equipment of NESBITT make to answer your heating, ventilating and air-conditioning problems.



NESBITT-MADE EQUIPMENT

WN UNIT HEATERS



Webster Nesbitt

LITTLE GIANT
DOWN BLOW UNIT HEATERS
With Steel Heating Elements

COMBINING THE LIGHTNESS AND ADAPTABILITY OF PROPELLER-FAN UNIT HEATERS AND THE PERFORMANCE CHARACTERISTICS GENERALLY ASSOCIATED WITH BLOWER-FAN UNIT HEATERS.

- FOUR-SIDE DRAW-THROUGH CONSTRUCTION
- HIGH VELOCITY VERTICAL DISCHARGE
- SEVEN SIZES: 165,000 TO 450,000 B.T.U. PER HR. (At 2 lbs. Steam Pressure and 60° Entering Air)
- AIR DELIVERIES: 3420 TO 10,250 C.F.M.

SOLD EXCLUSIVELY BY
WARREN WEBSTER & COMPANY, CAMDEN, N.J.

SEND FOR PUBLICATION WN-118

NESBITT

JOHN J. NESBITT, INC., HOLMESBURG, PHILADELPHIA, PA.

Manufacturers of the Nesbitt Syncretizer Heating and Ventilating Unit, Nesbitt Heating and Cooling Surfaces, and Webster-Nesbitt Unit Heaters

The Nesbitt Syncretizer is sold by John J. Nesbitt, Inc., and American Blower Corporation • Nesbitt Surfaces are sold by leading manufacturers of fan-system apparatus • Webster-Nesbitt Unit Heaters are sold by Warren Webster & Company

Something Worth Looking For

Something much more important than natural or synthetic rubbers and fabrics is woven into every Dayton V-Belt. You might call it Technical Excellence. Or you might more accurately call it the heartaches and achievements of Chemical and Research Technicians who during 37 years have patiently devoted *millions of man-hours* of sweat and labor to continuous rubber and fabric research and development.

For example, in *one* year the men of Dayton Rubber have devoted more than 166,000 man-hours to V-Belt research and development. In addition during the same period, they have made over 1,000 separate laboratory tests and some 1,200 field tests.

Product of all this is a V-Belt built upon the enduring and constantly fortified foundation of priceless experience in the processing and application of all available (or likely to be available) combinations of natural or synthetic rubbers and fabrics. It bears the name Dayton Rubber. It is a name worth looking for.

THE DAYTON RUBBER MFG. CO.
DAYTON 1, OHIO

KEEP ON BUYING WAR BONDS

V-Belts by Dayton Rubber

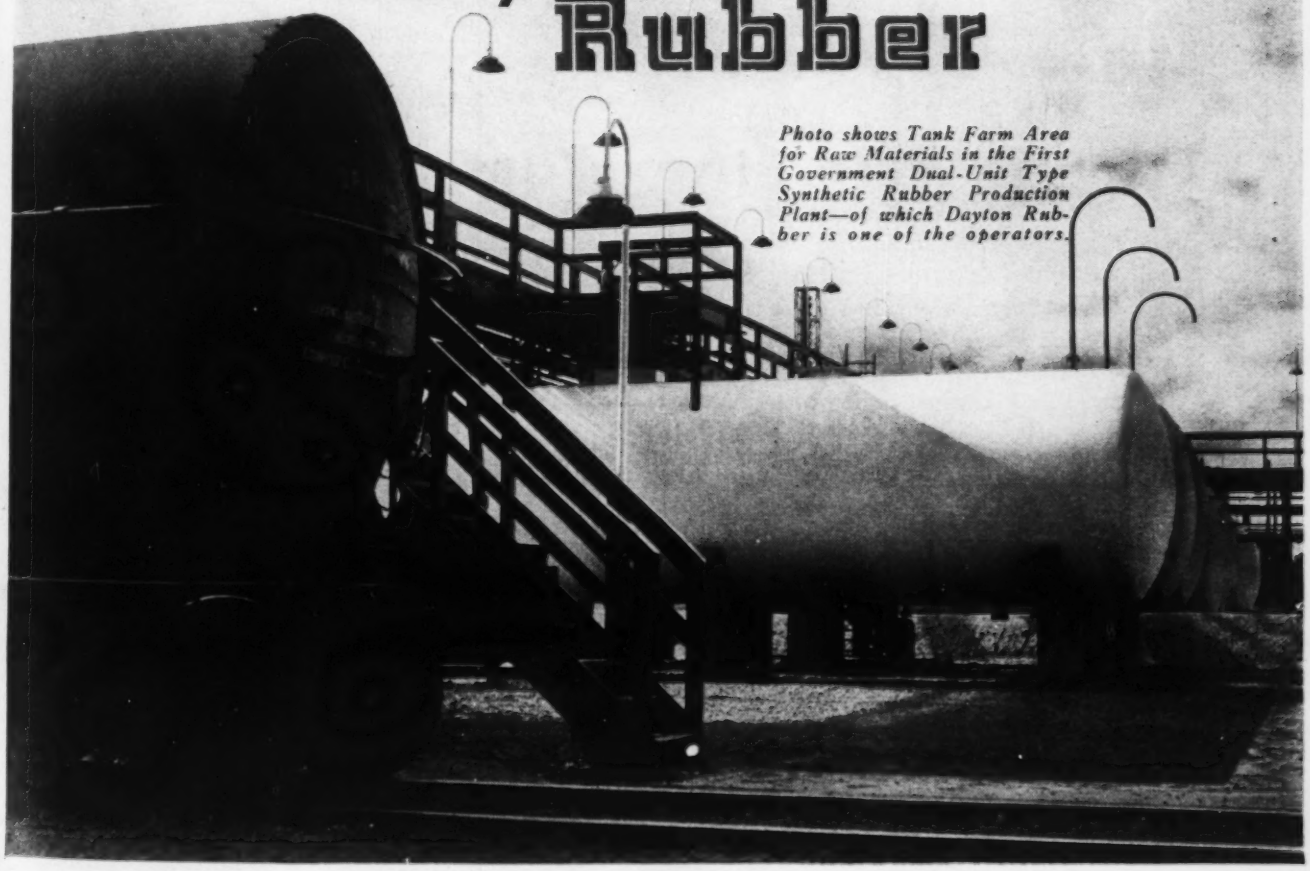
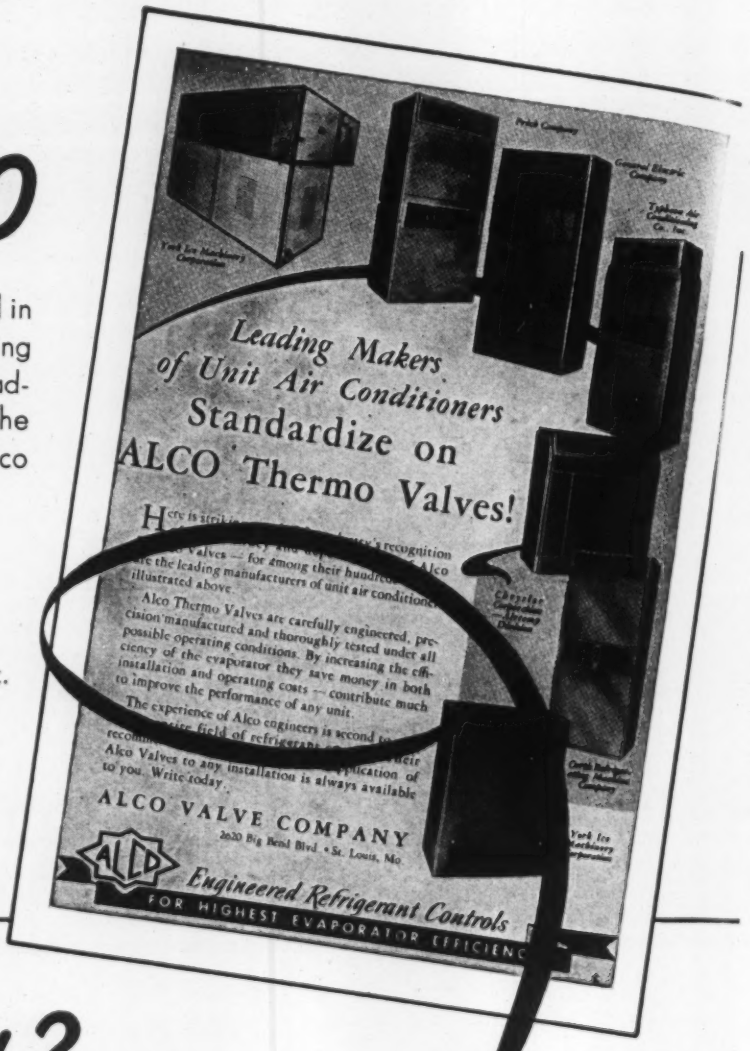


Photo shows Tank Farm Area for Raw Materials in the First Government Dual-Unit Type Synthetic Rubber Production Plant—of which Dayton Rubber is one of the operators.

Time - 1940

When this advertisement appeared in May, 1940, Alco Valves were being used as standard equipment on leading unit air conditioners. Among the manufacturers standardizing on Alco Valves were:

General Electric Company
Frick Company
York Ice Machinery Corporation
Typhoon Air Conditioning Co., Inc.
Chrysler Corporation, Airtemp Division
Curtis Manufacturing Company
And many others


Leading Makers of Unit Air Conditioners Standardize on ALCO Thermo Valves!
ALCO VALVE COMPANY
2620 Big Bend Blvd. • St. Louis, Mo.
ALCO
Engineered Refrigerant Controls
FOR HIGHEST EVAPORATOR EFFICIENCY

Time - 194? - After the War

The finest air conditioning units will still use Alco Valves for the same reasons we gave in the above advertisement:

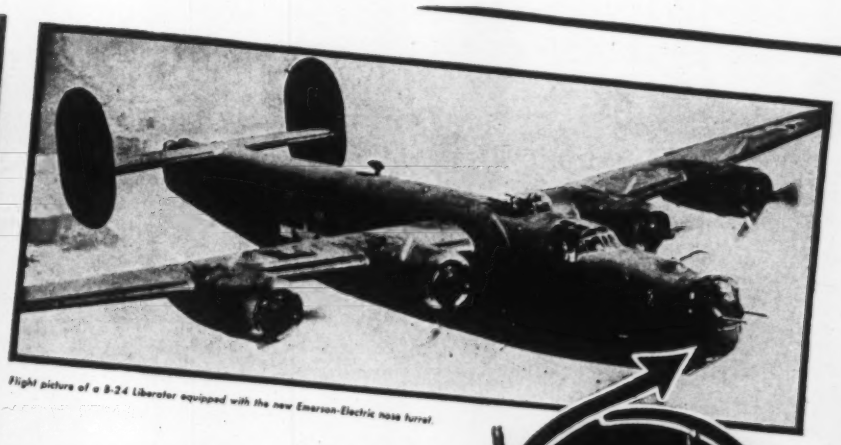
> **"Alco Thermo Valves are carefully engineered, precision manufactured, and thoroughly tested under all possible operating conditions. By increasing the efficiency of the evaporator they save money in both installation and operating costs — contribute much to improve the performance of any unit."**

If you are making plans for new postwar equipment now, we invite your inquiries as to the Alco Valves best suited to your individual requirements.

ALCO

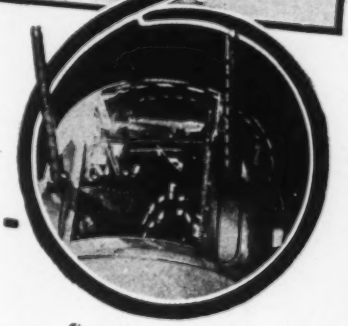
Designers and Manufacturers of Thermostatic Expansion Valves
Solenoid Valves
Float Valves
Pressure Regulating Valves

ALCO VALVE COMPANY — 869 Kingsland Avenue, St. Louis, Missouri



Flight picture of a B-24 Liberator equipped with the new Emerson-Electric nose turret

Emerson-Electric Builds *New Fighting Power* For the Air Offensive ---



Close-up view of the new nose turret, equipped with two .50 cal. guns.

Now it can be told—the interesting story of the development of the new nose turret designed and manufactured by Emerson-Electric for B-24 Liberators!

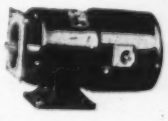
It began when Emerson-Electric was given the assignment of building a turret having maximum fire power with proper visibility, safety and comfort for the gunner.

The model B-24 nose turret designed by Emerson-Electric engineers, having these characteristics, passed a series of critical Army tests and was released for production immediately.

In addition to this powerful new weapon, Emerson-Electric has been producing in large quantities, upper-deck and lower ball power-operated airplane gun turrets used on the B-17 Flying Fortress, top turrets for Navy Avenger Bombers, and also top turrets for Army medium two-motor bombers.

Emerson-Electric is continuing to pioneer in the development of new and more effective armament for the air offensive—for quicker Victory through air power.

EMERSON-ELECTRIC AIRCRAFT MOTORS are made for gun turret drives, hydraulic units, fuel pumps, actuators, winterizing units, communication systems—also with built-in gear and magnetic brake.



THE EMERSON ELECTRIC MANUFACTURING CO.
SAINT LOUIS • *Branches:* New York • Chicago • Detroit
Los Angeles • Davenport

Emerson-Electric is now engaged 100% in producing equipment for the armed forces of the United States.

EMERSON ELECTRIC

MOTORS • FANS • APPLIANCES

A current Emerson-Electric advertisement in magazines of national circulation.

Bad News for Japs and Nazis...

...but good news for all who know the dependability of Emerson-Electric peacetime products. The precision manufacturing skill which, for 53 years, has characterized Emerson-Electric fans, motors and appliances, is now engaged 100% in vital war work—helping to speed the day of Victory.

Designing and producing a powerful new revolving nose gun turret for the B-24 Liberator Bomber is but one of the achievements for which Emerson-Electric was awarded the Army-Navy "E" and which recently earned a white star for the burgee.

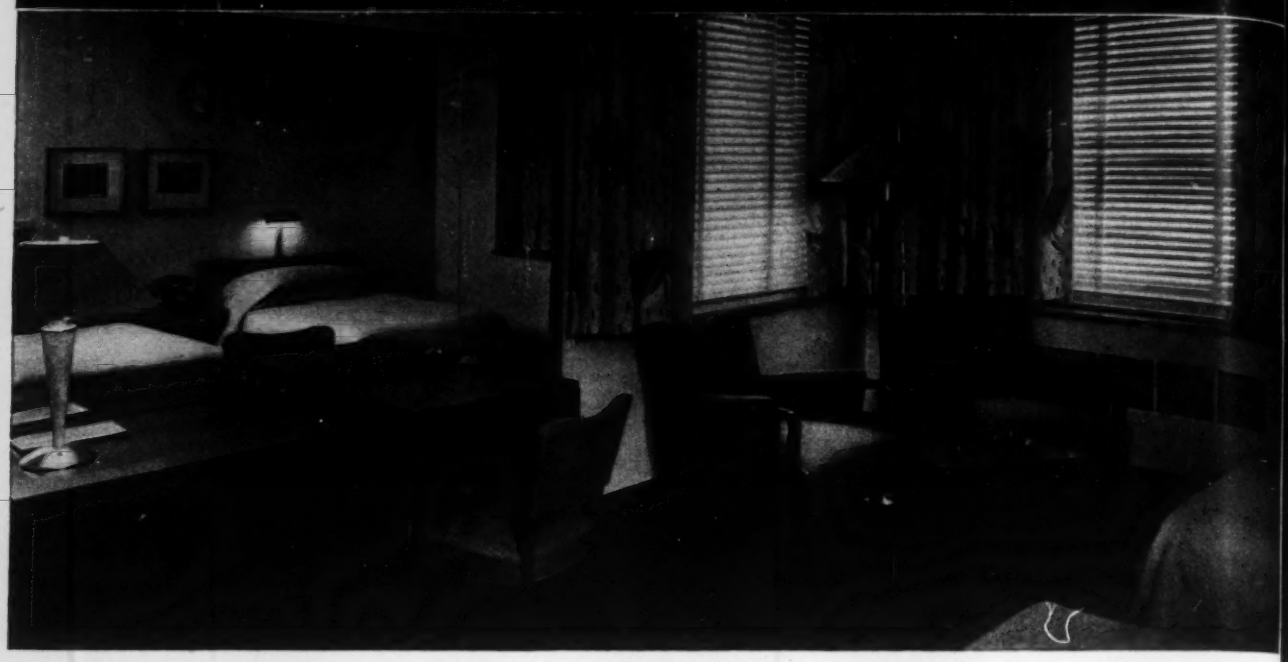
THE EMERSON ELECTRIC MANUFACTURING CO.
SAINT LOUIS
Branches: New York • Chicago • Detroit • Davenport
Los Angeles

359

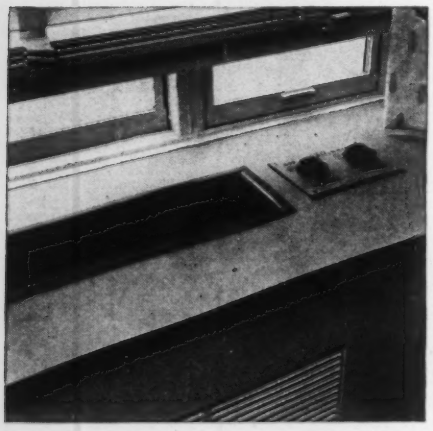
EMERSON ELECTRIC

MOTORS • FANS • APPLIANCES

WORLD'S LARGEST completely Air Conditioned Hotel opens in Nation's Capital



Heating and Ventilating Contractor: Mehring and Hanson Co., Chicago, Ill. Architect and Consulting Engineer: Holabird and Root, Chicago, Ill. General Contractor: Harris Co., New York.



Every guest room has a Carrier Weathermaster unit with individual control. Positive circulation of outside air is also provided.

New Statler in Washington, First Hotel To Install Carrier Conduit Weathermaster System

• Year round air conditioning of the entire building is an outstanding feature of the new Statler Hotel, most recent addition to Washington's rapidly rising skyline.

Two Carrier Centrifugal Refrigeration Machines provide a daily cooling capacity equal to the melting of 1,100 tons of ice. Individual Carrier Weathermaster units serve conditioned air to each guest room. Lobbies, dining rooms, corridors, and all public spaces are air conditioned from the central plant.

The air conditioning equipment was designed as an integral part of the building thus gaining space equivalent to two extra floors while keeping the height of the structure within building code requirements.

Occupants of guest rooms may dial "Warmer" or "Cooler" as desired. All air delivered to guest rooms is 100% outside air. Heated or chilled water is circulated in Weathermasters. In rooms receiving the full heat of the sun, cooling can be obtained while heating is being used in rooms which have northern exposure.

CARRIER CORPORATION, SYRACUSE, N.Y.

Carrier

ARMY E NAVY

AIR CONDITIONING • REFRIGERATION

Looking to the future, Robert E. Bingman, noted Detroit industrial designer, gives you his conception of a Truck of Tomorrow. You can build these vehicles better, faster, using Howell Electric Motors in your plant — the motors that are built today for the precision standards of tomorrow.

For the plants that build tomorrow's trucks . .

Horsepower by Howell

Be ready for pleasant surprises in motor vehicles . . . After Victory, under our free enterprise system, private industry must take the lead in maintaining prosperity. Many of the new products that will add so much to our way of living will be built in factories with Horsepower by Howell. For Howell Motors are designed and precision-built to meet the exacting standards of manufacturers who want maximum production at minimum cost.

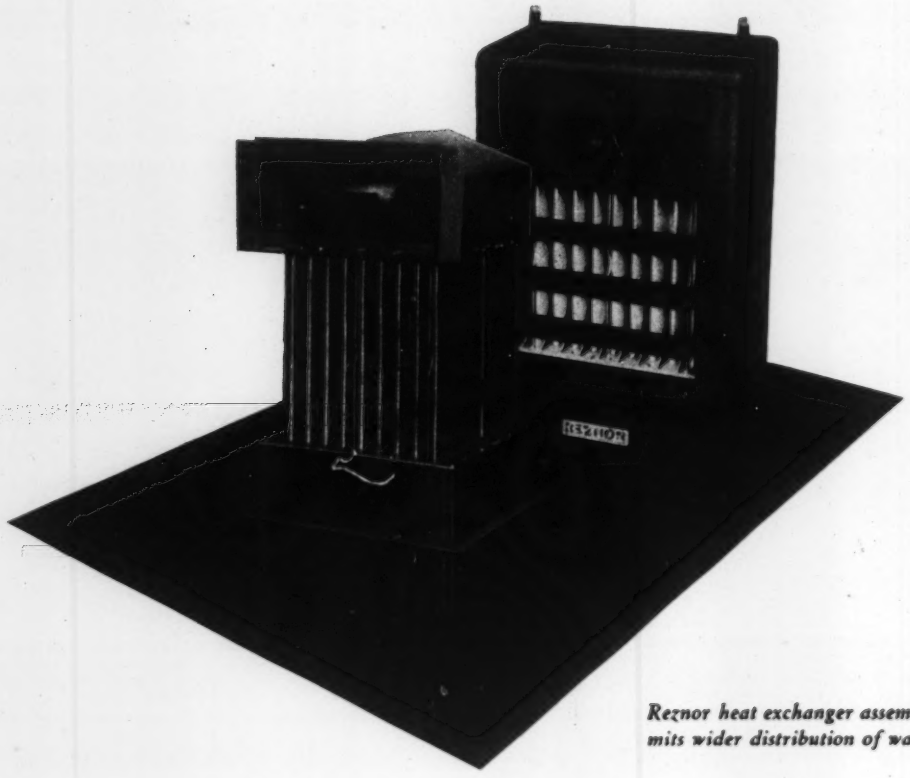
When making your postwar plans, specify Horsepower by Howell for your plant, process or products. Your inquiry will put our experienced engineering staff and complete facilities to work for you.

The **HOWELL IDEA**
in Electric Motors
precision-built

HOWELL ELECTRIC MOTORS COMPANY
HOWELL, MICHIGAN
Manufacturers of Quality Motors Since 1915

PUTTING MORE B. T. U.'s TO WORK WITH

REZNOR Unit Heaters



Reznor heat exchanger assembly permits wider distribution of warm air.

● Combustion liberates a certain number of B. T. U.'s, but efficiency of any heating unit is measured by the quantity of B. T. U.'s actually delivered as heat.

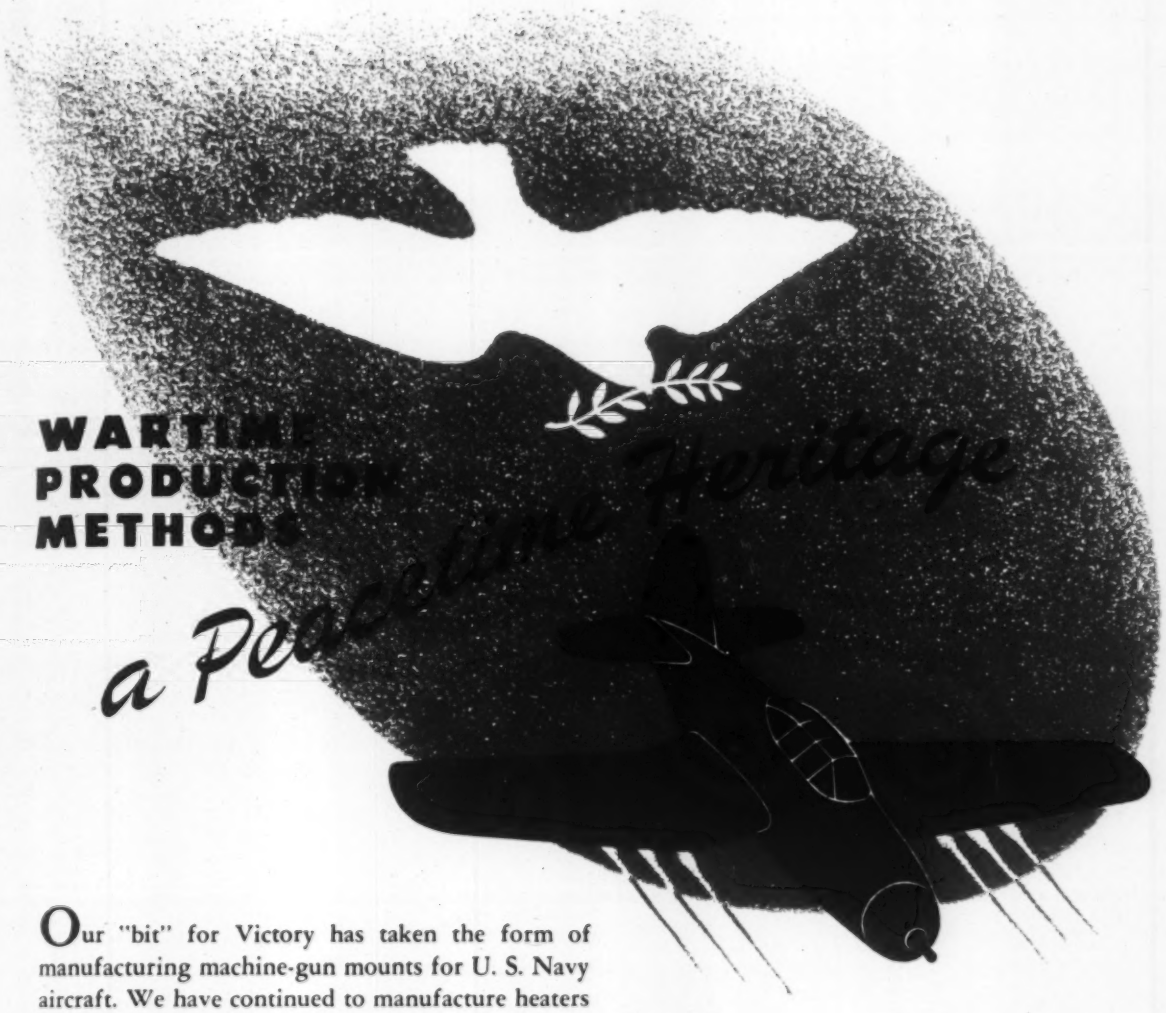
The Reznor Unit Heater delivers a maximum volume because the heat exchanger section is designed to permit the air to move quickly and efficiently over the heat exchanger tubes. There are no fins or projections to hold back the steady flow of hard-working B. T. U.'s. The compact, self-contained Reznor Heater is easily installed . . . can be relocated without difficulty.

Printed data available upon request. Write today.

REZNOR MANUFACTURING CO.—305 James St., Mercer, Pa.

MODERN GAS HEATING, THE REZNOR WAY
DOMESTIC
COMMERCIAL
INDUSTRIAL
REZNOR

"GAS HEATERS EXCLUSIVELY SINCE 1888"



Our "bit" for Victory has taken the form of manufacturing machine-gun mounts for U. S. Navy aircraft. We have continued to manufacture heaters and warm water heating specialties for the Maritime Commission, Army and Navy hospitals, laundries and bakeries and other essential Government and industrial projects.

Making machine-gun mounts is precision work of high order. It demands machines of extreme accuracy, workers of advanced skill. Many such machines have been added to our equipment. And our staff of workers—enlarged to about triple our peacetime force—is keyed to the highest precision standards.

This precision equipment, training and experience will become an invaluable heritage when the war is over and we can again resume our normal operations.

It will mean that the intricate parts that comprise Taco circulators, flow checks, relief valves, reducing valves, etc., will not merely meet their former high standards, but will all be made with that extreme precision demanded in Navy machine-gun mounts. It will mean that the Taco organization will have retained to the fullest its habits of working to close tolerances.

PRIORITIES NOTE

There has been a slight liberalization in government restrictions on the manufacture of heaters of copper tubing for essential civilian use. If you are in the market for a water heater of the most modern type, consult Taco wholesalers or write us for information on the latest procedures to follow in complying with W.P.B. regulations.

TACO HEATERS, INC., 342 MADISON AVE., NEW YORK 17, N. Y.
TACO HEATERS of CANADA, LTD., 24 ADELAIDE ST. W, TORONTO

Wartime food dehydration flings a challenge at America's air conditioning engineers

During World War I, our country was perfecting methods for dehydration of vegetables. By removing moisture from garden-fresh vegetables, these foodstuffs would be condensed, packaged to save space and weight. It sounded like a wonderful idea. Yet, after war ended, little more was heard about dehydrated foods.

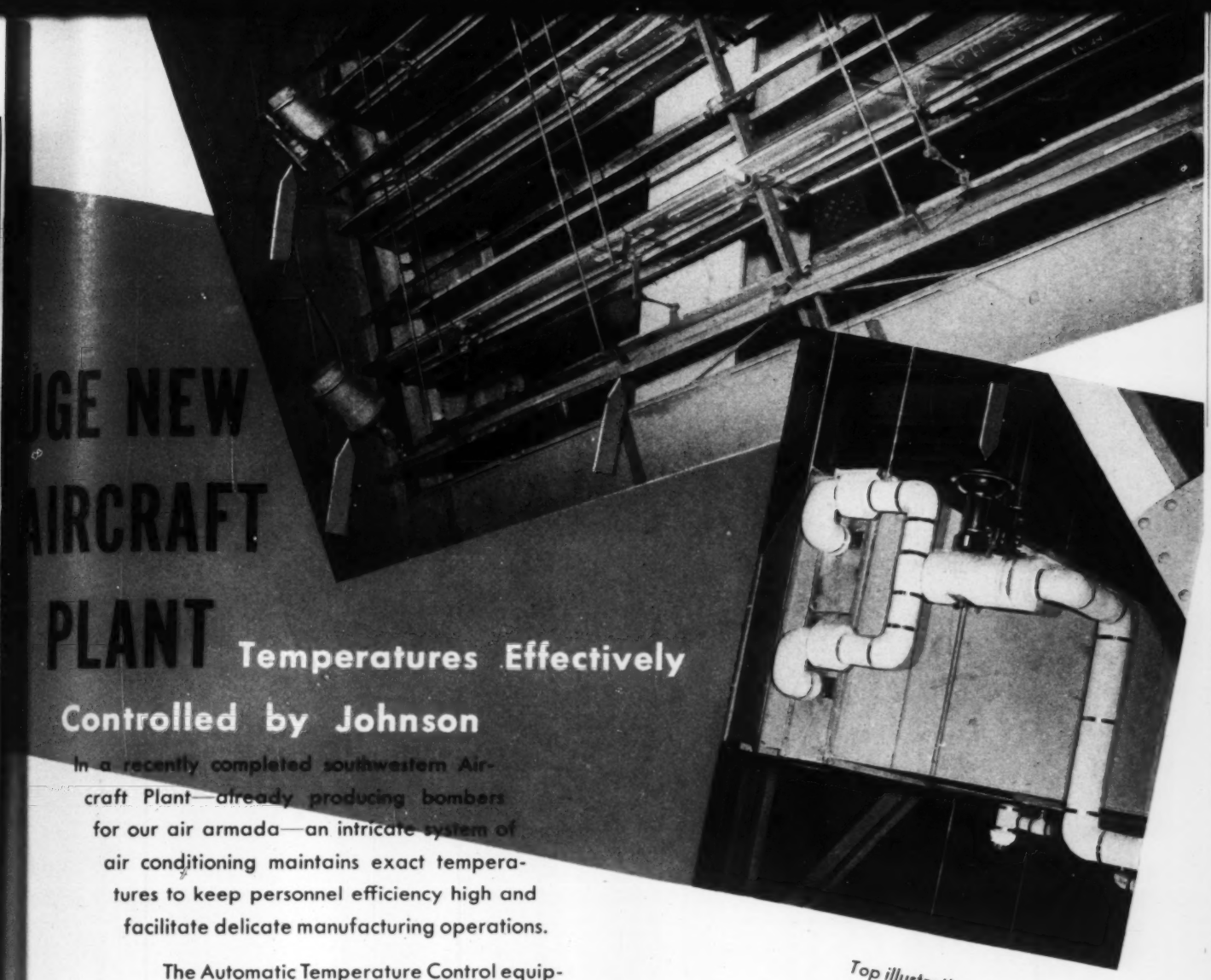
With Pearl Harbor and another war making food a fighting necessity, talk of dehydration again came to the forefront. Hundreds of thousands of tons of dehydrated foods were ordered by the armed forces and lend-lease. Plants plunged into production of this vast supply of concentrated foods.

Food processors have done a remarkable job. But it will be necessary to perfect final-stage drying operations before the industry is satisfied it has complete mastery of the involved process. This is a task which only air conditioning engineers can solve.

Successful final drying requires extremely low vapor pressure in the finishing bin. This can be accomplished most satisfactorily by the Bryant Dehumidifier, because it pulls a progressively lower moisture content as the product dries, bringing the air to an almost anhydrous condition at the end of the process.

The success of food dehydration is largely up to the air conditioning engineer. Gentlemen . . . will you pull on the gloves for the next and feature bout?

Bryant
DEHUMIDIFIERS
THE BRYANT HEATER COMPANY
17825 St. Clair Ave., Cleveland 10, Ohio



UGE NEW AIRCRAFT PLANT Temperatures Effectively Controlled by Johnson

In a recently completed southwestern Aircraft Plant—already producing bombers for our air armada—an intricate system of air conditioning maintains exact temperatures to keep personnel efficiency high and facilitate delicate manufacturing operations.

The Automatic Temperature Control equipment, manufactured and installed by Johnson, stands vigil over the entire system. "Heating-cooling" thermostats, actually two thermostats built into one case, are the "brain" of the installation. During winter heating, a rise in temperature closes louvred dampers in the conditioning system. For summer cooling, the action is reversed, rising temperature causing the system to introduce more cool air.

Whatever your problem in air conditioning, heating, humidifying or process control, contact the nearest Johnson office, or write for bulletins covering equipment in which you are interested. In either instance there is no obligation.

Top illustration: Johnson piston-type damper control actuates the Johnson return air dampers.

Lower illustration: Johnson valve on booster heater coils in ducts which carry super-heated air to outside walls, where winter heat losses are greatest.

BACK THE ATTACK—BUY MORE BONDS

JOHNSON

Automatic TEMPERATURE AND AIR CONDITIONING *Control*

JOHNSON SERVICE COMPANY, MILWAUKEE 2, WIS. • DIRECT BRANCHES IN ALL PRINCIPAL CITIES

They'll keep rolling—

YOU can leave that part of it up to the Army. But it's our job to "keep 'em rolling" off the production line. It's your job too, whatever your walk of life, to help put power behind this effort, whether you are engaged in actually building combat tanks or tank hulls, as we are, or the engines that drive them, the guns that arm them, the ships that carry them, or the homes that shelter the men who do any of those things. You may be doing your job by offering a word of encouragement to a tired worker, or by stepping hard on a silly rumor of the kind that Hitler would like to hear, and—as with all of us—by buying the War Bonds that are the real power behind America's drive for freedom.

Here at Fitzgibbons we're "keeping 'em rolling"—a steady stream of huge welded steel combat tank hulls ready for the final assembly at one of the great tank arsenals. The men, women and equipment of Fitzgibbons are doing their bit in putting the ax to the Axis.

BUY
U. S. WAR BONDS
AND STAMPS

The Army-Navy "E" flag, emblem of patriotic endeavor, flies proudly over the Fitzgibbons plant.

FITZGIBBONS BOILER COMPANY, Inc.
101 PARK AVENUE, NEW YORK 17, N. Y.
Works: Oswego, N. Y. • Branches in Principal Cities

FITZGIBBONS

STEEL HEATING BOILERS SINCE 1886

An advertisement that most manufacturers wouldn't run—

APPARENTLY the basic rule of people who write advertising is: Soft pedal everything the advertiser ever did wrong and make a lot of noise about everything he ever did right.

We are violating that rule in this advertisement. Maybe we are wrong, but it seems to us that the only way to show you why the McDonnell No. 150 is the most dependable water level control for high pressure steam boilers, is by candidly admitting our earlier mistakes.

As you might know, the mistakes were not due to inexperience. No one ever put more research, testing and experience into the designing of a water level control than we put into the No. 150. So of course the No. 150 was a good control from the start.

But we soon found that high temperature and pressure can mess up the best laid plans. Despite the careful designing and quality construction, "bugs" began to show up. Not big things (we were too experienced for that) but little troubles that we can't permit in McDonnell products.

One example was the soldering of the bellows. Despite the fact that it was removed from the heat of the float chamber by the long neck with heat-dissipating fins, trouble occasionally developed. The drawing shows how we corrected this. We developed a mechanical seal that never lets go. It involved precision machining operations—additional cost—but it does the work.

Another example was the wiring. Although we used wires with the best heat-resisting insulation commercially available, trouble bobbed up here and there. To correct this we changed to wires protected by porcelain beads as illustrated—insulation that has never been known to go wrong. In the same category was the terminal unit. We had made it out of a good insulating material with high grade fibre separators between terminals. But despite this precaution we had to go to a cast porcelain unit as illustrated. This cost more, but ended all trouble for keeps.

Still another refinement was the limit stops on the switches. Adjustable switches are desirable, but sometimes the installer over-stepped the adjustment. As now designed, any proper adjustment can still be made; but limit stops prevent any setting that could cause trouble.

We are pointing out these things to show you why the important job of protecting those vital, all-but-irreplaceable pressure boilers should only be entrusted to a control that has been developed to the highest stage of perfection in the tough school of on-the-job experience.

Other refinements, fundamental advantages, and service range of the No. 150 are covered opposite.

Write for the big No. 150 Data Book containing clear installation and wiring instructions.

McDONNELL & MILLER, 1316 Wrigley Building, Chicago 11, Illinois

Doing One Thing Well

McDONNELL No. 150

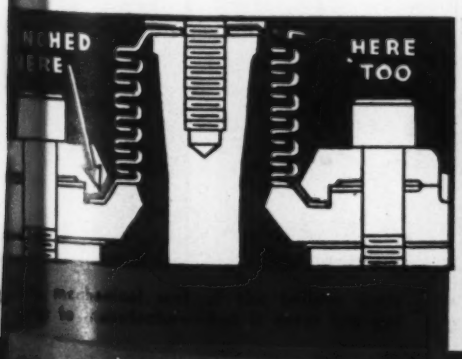
Boiler Water Level Control for Pressure Boilers

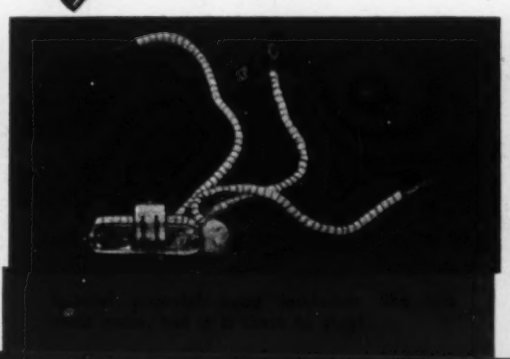
Here in one dependable device you have the answer to the water level control problem in any hand fired or automatically fired steam boiler operating at pressures up to 150 lbs. Five accessible terminals provide circuits for:

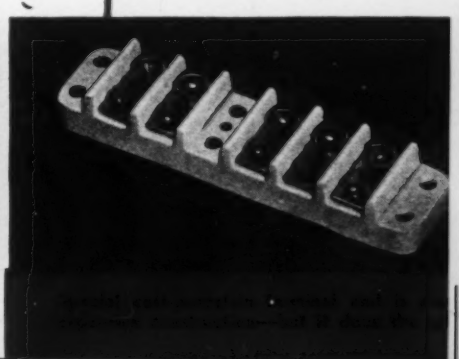
(1) Low Water Cut-Off.
(2) Low Water Alarm.
(3) Control of electric condensation pump.
(4) Any combination of these functions.

It is regularly equipped with automatic reset, but is also available with manual reset on the low water cut-off switch.

Note refinements like the two openings for conduit in the head; the float guide with limit stops; the total elimination of packing. Switches are specially made to withstand high temperature—are fully adjustable. Bellows is extra strong. Knife edges in the fulcrum (costly construction) eliminate friction; assure proper alignment of switches. Modern production methods give you all this at a moderate price!







"TO YOUR GOOD HEALTH, SOLDIER"

Yes, we drink to your health . . . but we do more. We work night and day to keep it a reality. We help keep your barracks, mess-rooms, and recreation-rooms at healthful temperatures. We help keep your clothes clean, and sanitary. We help prepare your proper, well-balanced diet.

Yes, here in York we are devoting all our efforts toward backing you up 100%. Much of our work is producing York Oil Burners that are seeing service on almost every front. And you can bet that it is the finest burner that our long years of experience make it possible to produce.

Supplying dependable heating-units for your laundries, quarters, and kitchens that stand-up under battle conditions, has taught us a lot, too. And when you come home, you'll find new features engineered into York Oil Burners that will mean new comforts and new conveniences.

* * *

Buy Bonds, and keep on buying, so that we'll have the purchasing power to provide these men with jobs when they return.

YORK HEAT

Division of YORK-SHIPLEY, INC., York, Pa.

CULTIVATING TOMORROW'S MARKET

Today!

When the shouting's all over and you settle back to cashing-in on the tremendous post-war market, York Heat will be on hand to help you with the finest oil-burners in its long history.

Building up an acceptance for York Heat is also part of the job. Every month hundreds of your future customers are reading York Heat messages like these in leading magazines.

Be sure to include York Heat in *your* post-war plans. In the meantime, copies of the York Heat Service Manual are available to help you service your present customers.

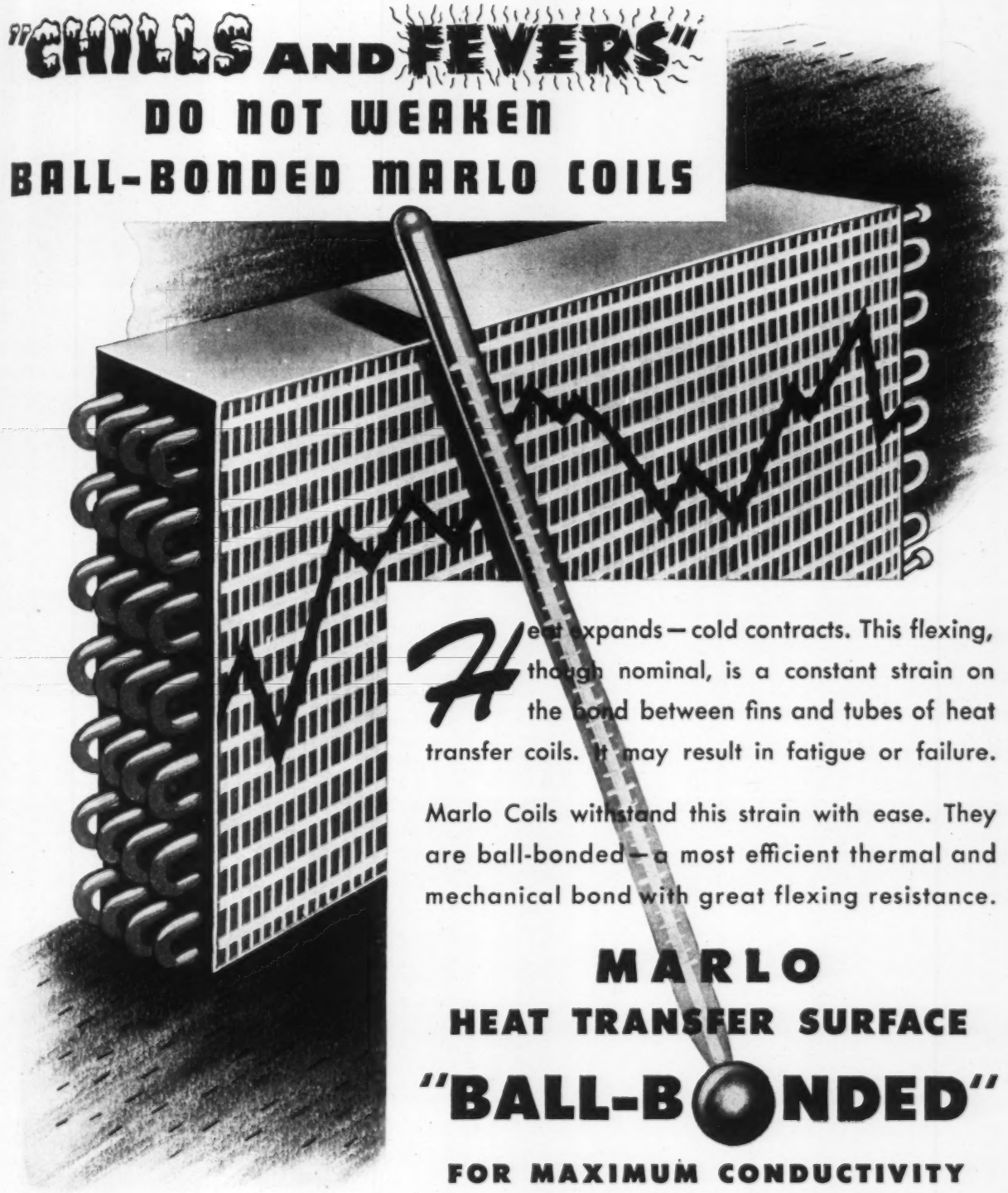
This is another of the YORK HEAT advertisements appearing regularly in:

AMERICAN HOME — HOUSE *and* GARDEN
HOUSE BEAUTIFUL — TIME (*Canadian Edition*)
BETTER HOMES *and* GARDENS

YORK HEAT

***Division of* YORK-SHIPLEY, INC., YORK, PA.**

"CHILLS AND FEVERS" DO NOT WEAKEN BALL-BONDED MARLO COILS



Heat expands—cold contracts. This flexing, though nominal, is a constant strain on the bond between fins and tubes of heat transfer coils. It may result in fatigue or failure.

Marlo Coils withstand this strain with ease. They are ball-bonded—a most efficient thermal and mechanical bond with great flexing resistance.

MARLO HEAT TRANSFER SURFACE "BALL-BONDED"

FOR MAXIMUM CONDUCTIVITY

MARLO MEANS HEAT TRANSFER EQUIPMENT

This advertisement is one of a series illustrating features of Marlo Products. If you wish complete sets, write for series HP.

MARLO COIL COMPANY

ST. LOUIS, MISSOURI

Blueprints in the Stratosphere

AGAINST a stratosphere ceiling are projected many of the plans for tomorrow's Air-Conditioning progress . . . blueprints in a sky without limiting horizons for human comfort.

Worthington's work on Air Conditioning has not halted through wartime concentration on its production for essential industries. Rather it has gained new heights of discovery — added wider vision to years of research and accumulated knowledge.

Out of equipping giant bomber plants and engine-test chambers, for example, has come a fund of information that is to be put to work in the general interest of commercial projects now on your boards.

War secrecy today limits the availability of these most modern developments. They will however be at your disposal at the conclusion of the present crisis.

Even now, much aid can be given to architects and engineers who are working on specific projects for post-war modernization and new building construction. Why not call the nearest Worthington office into consultation?

CAD-43

WORTHINGTON PUMP AND MACHINERY CORPORATION, HARRISON, N. J.
District Offices and Representatives in Principal Cities

Air Conditioning
WORTHINGTON
REFRIGERATION

WORTHINGTON AIR CONDITIONING AND REFRIGERATION

Worthington advertisements in Time, Newsweek, Architectural Record and elsewhere are addressed to the planners of tomorrow's world of air conditioned buildings of all kinds...

AIR CONDITIONING

Signs of Good Business...

Air Conditioning and Refrigeration . . . these are the twin-opportunities of tomorrow's big business for all sales-minded engineering or contracting organizations.

All signs point that way . . . faster and cheaper production in modern air-conditioned war plants confirms it.

It has been said on the authority of one of the country's leading engineers that 80% of present industrial plants will have to come to it . . . or stagnate along the obsolete "routes" of yesterday.

That's part of your market. These plants must be modernized, or lose out in competition.

But that's not all. Commercial and public buildings. And homes—one authority estimates more than 900,000 *new* residences alone.

All these lie on your highway of opportunity when V-DAY dawns. Will you be in the van of "profit-traffic" when this highway is officially opened?

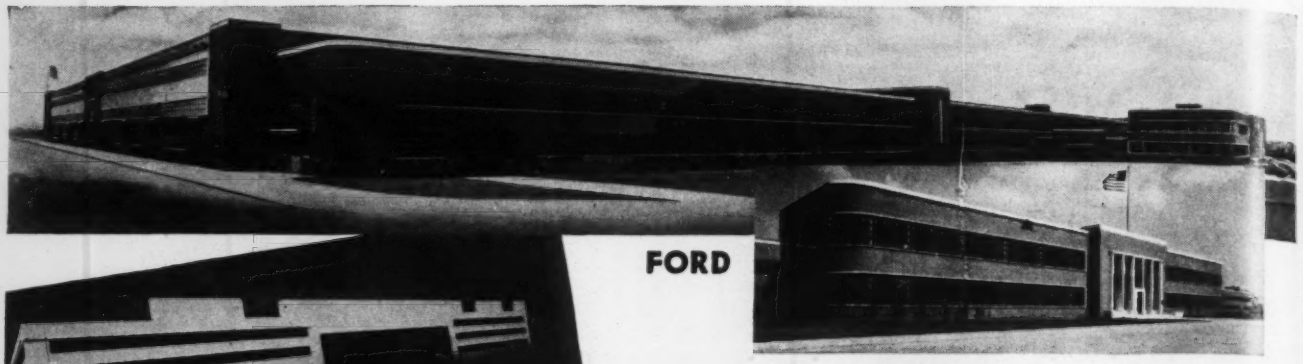
A Worthington franchise is your best insurance of a preferred place "in line". Why not consult us *now?*

CA3-45

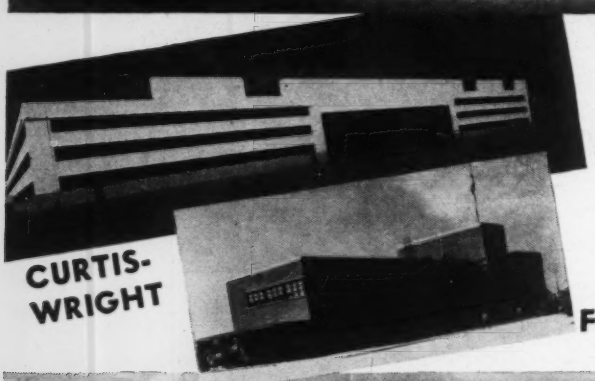
WORTHINGTON PUMP AND MACHINERY CORPORATION, HARRISON, N. J.
District Offices and Representatives in Principal Cities

WORTHINGTON

A N D R E F R I G E R A T I O N

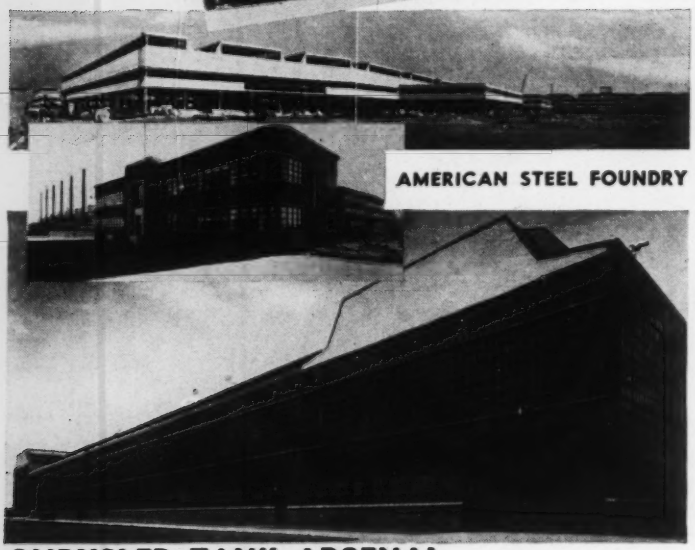


FORD



CURTIS-WRIGHT

FORD



AMERICAN STEEL FOUNDRY

CHRYSLER TANK ARSENAL

KAHN *Specifies* SARCO

Functional perfection achieves natural harmony in the industrial buildings of Albert Kahn and the plans provide also for satisfactory operation in every detail.

In all of the plants illustrated or mentioned on this page, Sarco is used for one or more of the products shown below.

Reliable heat and air conditioning, controlled temperatures, steam saving devices, and adequate provision for economical hot water supply were written into the specifications by the simple word "Sarco."

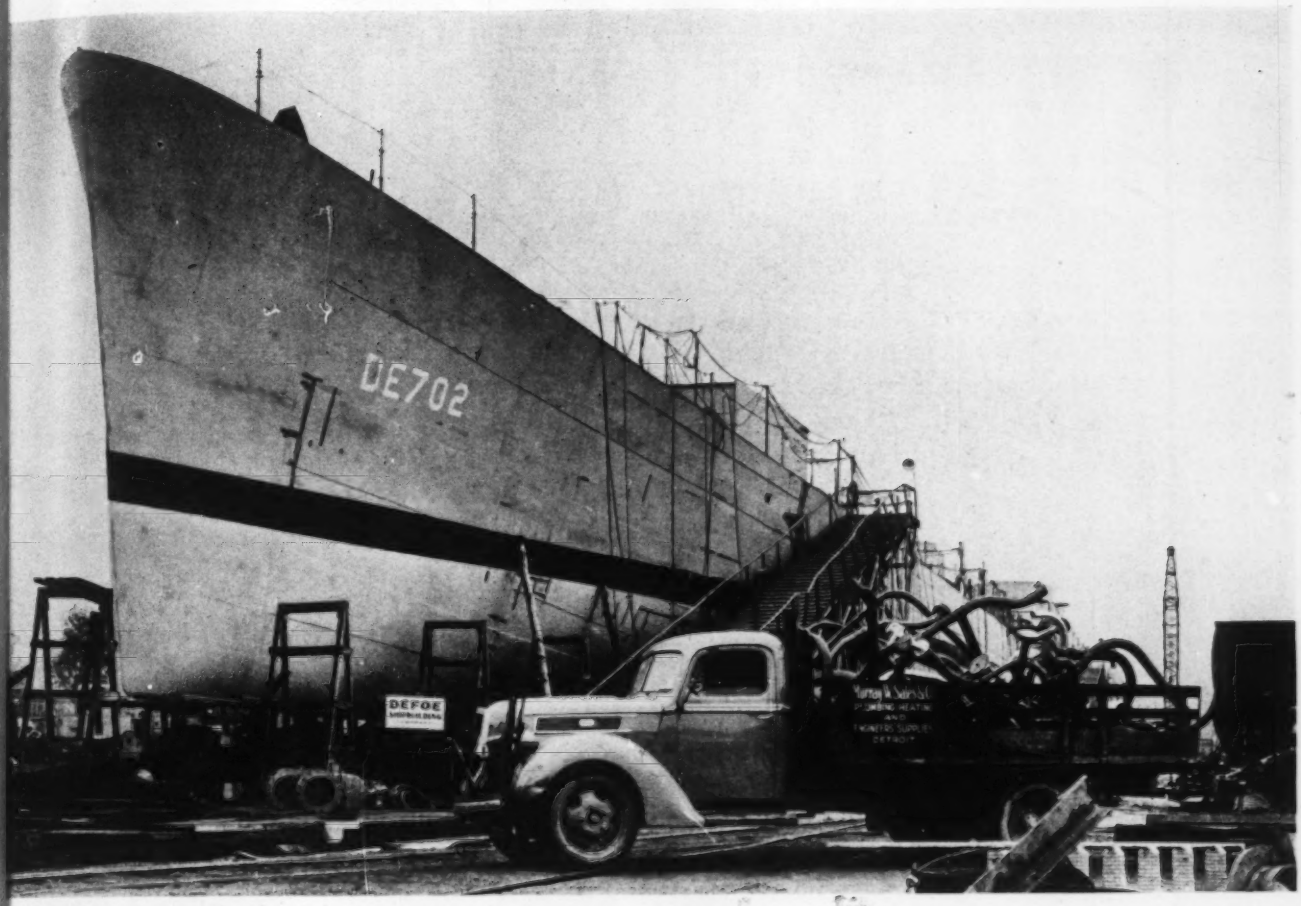
These same products in the same applications are equally adapted to the smallest apartment house, commercial or industrial building. When it's steam traps, hot water or temperature control, you can safely specify "ALL SARCO" and rely upon the quarter century of experience, available through our nearest representative.

and...

The Municipal Courts Building, The Children's Free Hospital and the Detroit Times Building, Detroit • The Buick Motor Car Co., Aluminum Foundry, Flint • The Chevrolet Motor Car Co., Aluminum Foundry, Saginaw • The University of Michigan Dormitory Buildings, Ann Arbor • The Pontiac Motor Car Co., Gun Plant, Pontiac • The Fairchild Aircraft Plant at Burlington, N. C. • Ford Motor Co. Drive-Away Buildings, Detroit & Somerville, Mass. • United Aircraft, Pratt-Whitney Plants, Hartford, Conn. • The General Motors Corp. Diesel Engine Plant, Detroit • The Ethyl Gasoline Corp., Chrysler Corp. Forge Plant, Detroit • Curtis-Wright, Lockland, Ohio

SARCO Saves Steam

SARCO COMPANY, INC., 475 FIFTH AVENUE, NEW YORK, N. Y.



Another

DEFOE "ROLLOVER"

one of the most important jobs for the Navy

using

"SALES" PREFABRICATED PIPING

Fabricated by

Murray W. Sales & Co.

PIPE FABRICATION DIVISION

Over 48 years of dependable service

PIPE BENDING • VANSTONING • PRESSURE WELDING • PIPE COILS • COMMERCIAL X-RAY

Detroit, 2 - - Michigan

WeldELLS have everything*

"They're built to give the man on the job a hand"

FROM the way they pile the work on me these days you'd think my job as foreman of the pipe crew is to put in the piping today that the front office won't finish planning till tomorrow!

The front office crowd might consider that laying it on a little thick. But whatever they think, they will have to admit that we have kept up with their wildest demands and done the job right, too.

Of course the main credit for that goes to fellows who do the work. But down to the last man they would be the first to agree that they couldn't have covered as much ground, or covered it as well, if it hadn't been for their old friend, WeldELLS.

WeldELLS and other Taylor Forge Welding Fittings are built to step in and give a hand. You don't have to grope for the proper size because size and weight are marked right there on the fitting. Tangents make them easy to line up. Accurate lathe bevels and lands make welding fast and sound. Precision quarter-marks guide the work.

If you want a fast job — a sound job — an economical job — take a tip from me and use the welding fittings that have *everything!*

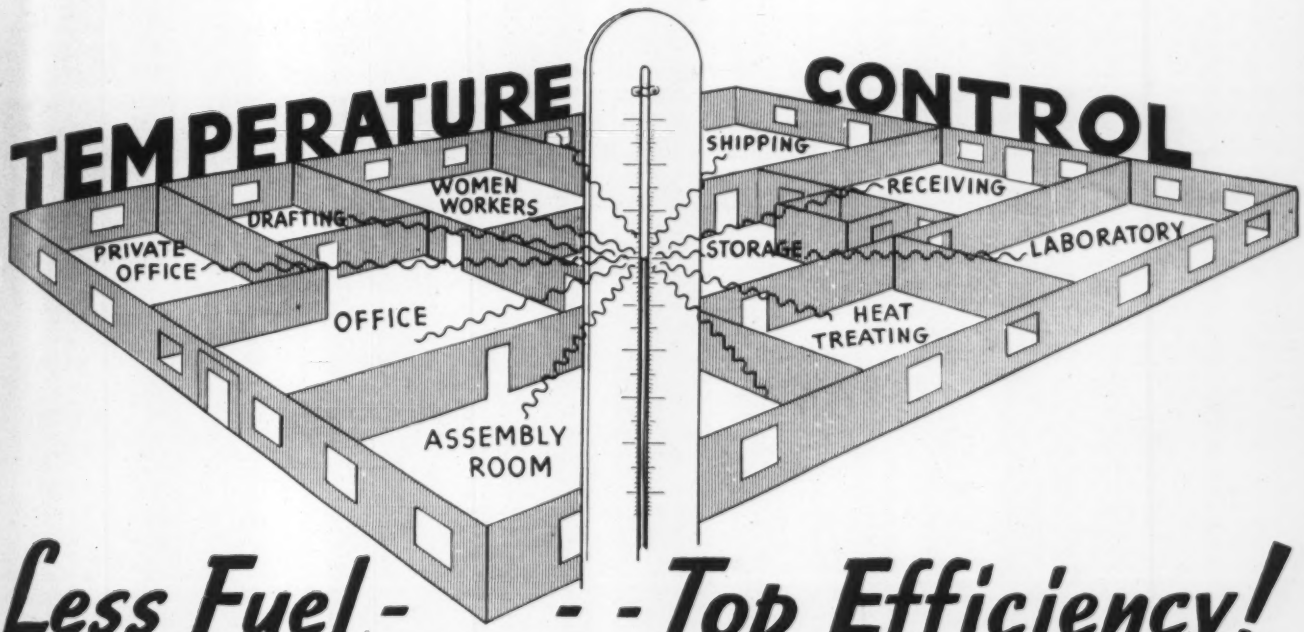
★ **WeldELLS alone have all these features:**

- **Seamless** — greater strength and uniformity.
- **Tangents**—keep weld away from zone of highest stress—simplify lining up.
- **Precision quarter-marked ends**—simplify layout and help insure accuracy.
- **Selective reinforcement** — provides uniform strength.
- **Permanent and complete identification marking**—saves time and eliminates errors in shop and field.
- **Wall thickness never less than specification minimum**—assures full strength and long life.
- **Machine tool beveled ends**—provides best welding surface and accurate bevel and land.
- **The most complete line of Welding Fittings and Forged Steel Flanges in the World** — insures complete service and undivided responsibility.

The list of Taylor Forge's contributions to the war effort only begins with WeldELLS. One of many examples is Taylor Corrugated Marine Furnaces, essential to many merchant ships and transports.

* WeldELLS and many other Taylor Forge products are produced in Byers Genuine Wrought Iron.

TAYLOR FORGE & PIPE WORKS, General Offices & Works: Chicago, P. O. Box 485
NEW YORK OFFICE: 50 CHURCH ST. • PHILADELPHIA OFFICE: BROAD ST. STATION BUILDING



Less Fuel - - - Top Efficiency!

with DUX-SULATION

Temperature control is the goal of all Heating Engineers. Asbestos protected Dux-Sulation, the all-purpose insulation helps materially in attaining this goal by providing a 1/2" blanket of insulation around ducts which stops loss of heat from the ducts. With Dux-Sulation the duct that supplies that hard to heat office or workroom will supply it with its full share now without "firing up"! That easily heated room will not be overheated as the ducts that pass through are not now giving off extra heat.

In this way by proper regulation of the duct damper temperature control is possible and a direct saving of vitally needed fuel is obtained.

Dux-Sulation also lowers maintenance costs and protects metal ducts against CONDENSATION and rust — not to mention the increased efficiency of workmen and office personnel.

Dux-Sulation can easily be applied to your existing air conditioning duct work without interrupting its operation and without inconvenience. Requires no maintenance and lasts indefinitely.

Dux-Sulation can be given any type of surface treatment and is attractive when installed.

Preserve your Ducts, don't let them RUST by ordering Asbestos Protected DUX-SULATION today from your local Heating Supply House.

Immediate shipment in any quantity. Get the most out of your Air Conditioning System

DUX-SULATION IS

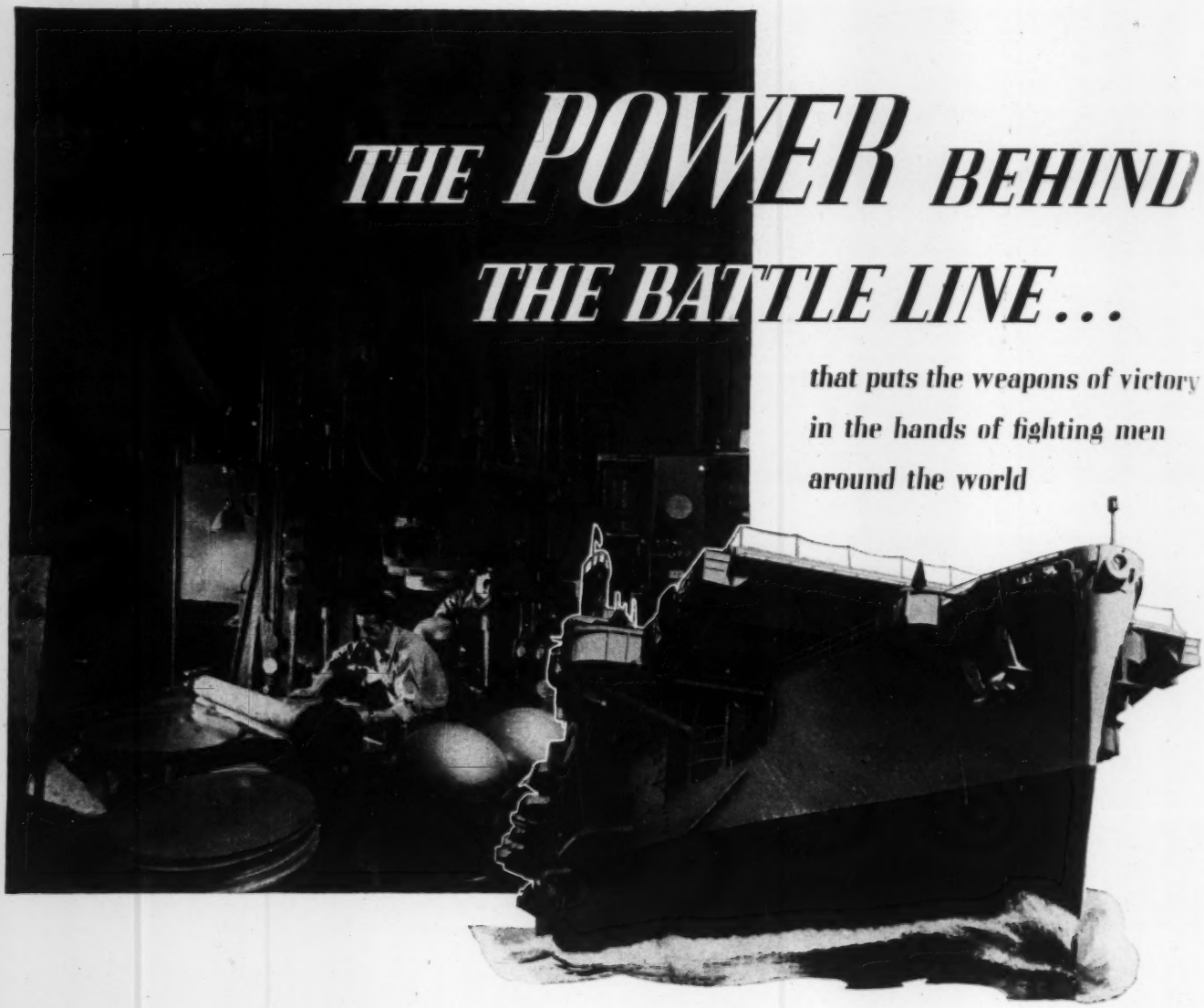
A flexible insulating blanket 1/2" thick, having a K factor .27 B.t.u. Comes complete with corner tape and adhesive for cementing on to sheet metal duct work. Dux-Sulation comes 36" wide in a roll containing 100 square feet. Easy to apply and a very efficient insulation against temperature losses, condensation and noise travel. Will not rot, chip or crack.

Write for Bulletin No. 407-H

4101 WEST TAYLOR ST. **GRANT WILSON, INC.** CHICAGO ILLINOIS

THE POWER BEHIND THE BATTLE LINE...

that puts the weapons of victory in the hands of fighting men around the world



Bombers, tanks, shells, bazookas—all the thousand and one items of supply vital to the war—pour out of America's factories in tremendous quantities . . . Ships go down the ways at a rate the world had not even dreamed of . . .

And to back the great attacks now beginning, America's war production must rise to still greater heights this year.

The entire TODD COMBUSTION EQUIPMENT organization is proud to be playing its part in this mighty effort.

For 30 years TODD burners have won for themselves a unique reputation for continuous and efficient production of power and heat, both on land and sea. Since Pearl Harbor, TODD has met, and is now constantly meeting, the enormous demands for efficient combustion equipment for new and converted war plants, and the rapidly growing Navy and Merchant Marine!

All TODD burners today are on high priority. But when victory is won, the company will again serve the many organizations who today cannot obtain combustion equipment—commercial buildings, plants manufacturing civilian goods, churches and schools.

New research development, born of the war, will enable TODD to provide still greater efficiency and economy in boiler plant operation on both land and sea.

TODD SHIPYARDS CORPORATION

TODD COMBUSTION DIVISION

601 West 26th Street, New York 1, N. Y.

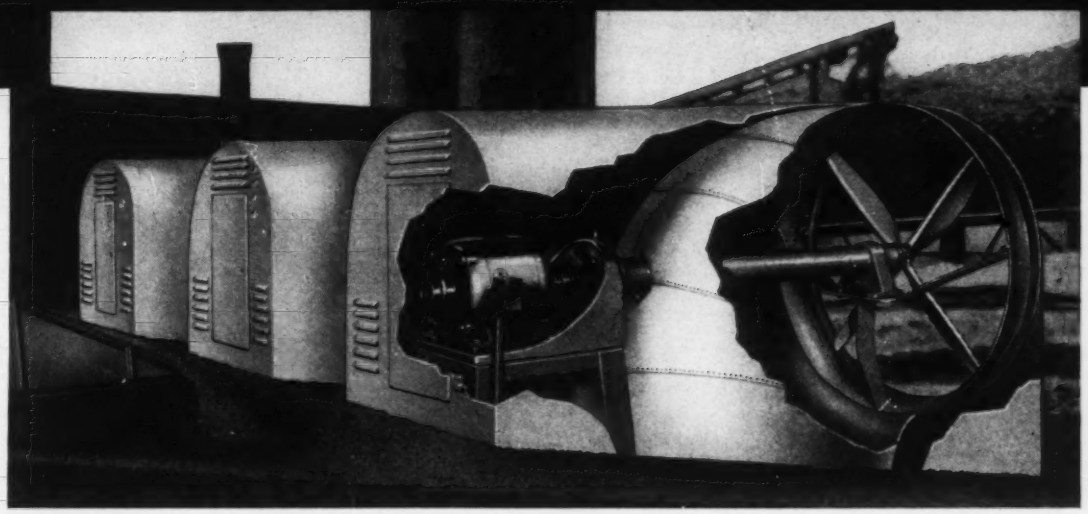
ARMY E NAVY

NEW YORK ★ MOBILE ★ NEW ORLEANS ★ GALVESTON
SEATTLE ★ BUENOS AIRES ★ LONDON

Turn every heat unit into useful power or heat! Fuel waste is sabotage.

ON THE FIRING LINE OF AMERICA'S WAR PRODUCTION FRONT
TODD BURNERS

HERE'S ANOTHER *Moisture* PROBLEM THAT PROPELLAIR EXPERTS SOLVED!



This view of the roof shows three of the five "huts", with one cut away to reveal detail of the Propellair fan installation.

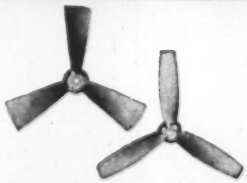
Better Results with Half the Horsepower

Moisture-laden air in the drying rooms of a large New England paper mill wasn't being withdrawn fast enough. The fan installation, which probably would have been satisfactory under less severe conditions, simply couldn't handle this job.

Propellair made a careful study of the problem, calculated the requirements and recommended Propellair equipment to meet them. Five Propellair 5 H.P. Type CE Fans were installed in "huts" on the roof. They moved a total of 225,000 cubic feet per minute—exactly what was needed. The customer reports that the Propellair installation does a better ventilating job at half the horsepower used by the former system.

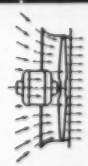
TWO VITAL PROPELLAIR FEATURES

AXIAL-FLOW, AIRFOIL PROPELLERS



Special Propellair design results in air-flow that is even over all parts of the blade—not just the tips. Maximum air with minimum horsepower. Propellers are non-overloading.

CURVED ENTRANCE RING



This Propellair feature makes possible the utilization of the Airfoil air-movement principle in the ring as well as the propeller. Considerably more air per horsepower is delivered.

Let us show You how we can solve Your Problem

It doesn't make any difference what your ventilating problem is—moisture, heat, fumes or dust—it can be completely solved by Propellair ventilating specialists and Propellair equipment. It will be worth your while to mail the coupon for further information—or write a letter giving specific details of your problem. You will not be obligated in any way.

MAIL THIS COUPON TODAY!

PROPELLAIR INC.
"Moving Air Is Our Business"
SPRINGFIELD • OHIO

PROPELLAIR, INC., Springfield, Ohio (23)

Please send complete information on Propellair Ventilating Equipment.

Name..... *Position*.....

Firm Name.....

Street Address..... *City & State*.....

My ventilating problem involves:

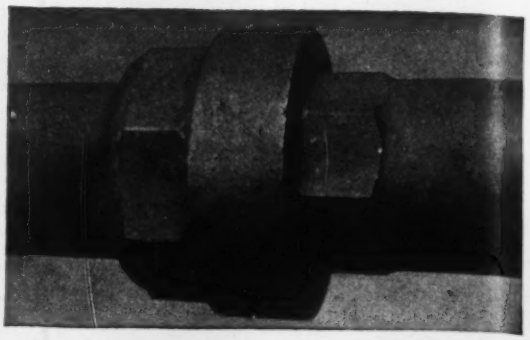
☐ Heat ☐ Fumes ☐ Moisture ☐ Dust

Walworth Hi-Test Cast Iron Threaded Pipe

gives these three special advantages

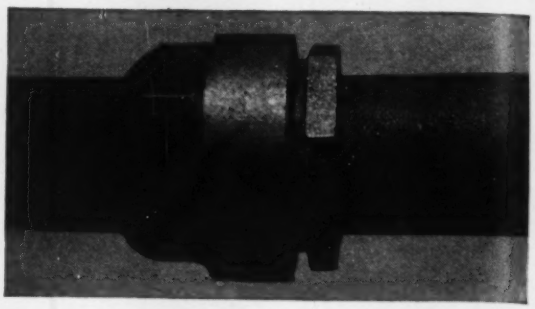
1 CORROSION RESISTANCE where it's needed most

Extra wall thickness at the threads in Walworth Hi-Test Oversize Threaded joint provides greater strength and resistance to corrosion.



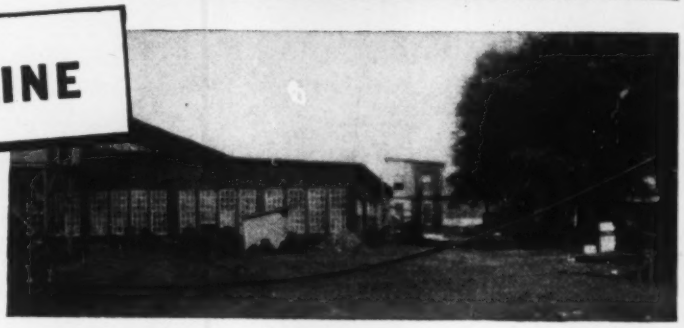
2 TIGHT EXPANSION JOINTS

Hi-Test flexible expansion joints, available with Walworth Hi-Test Cast Iron Pipe, provide a tight connection and allow for 1½" expansion or contraction. There are no exposed threads or bolts.



3 FLEXIBILITY IN THE LINE

Notice the unusual flexibility achieved with a Hi-Test expansion joint and two standard 20′ lengths of 1¼" Walworth Hi-Test pipe.



Walworth I.P.S. Hi-Test Cast Iron Threaded Pipe with regular pipe size threads is primarily for use in drainage, vent and waste lines in buildings and for pipe lines above or below ground. It complies with Federal Specification No. WW-P-356, dated August 19, 1936, and is recommended in all sizes for 175 lbs. Non-Shock Cold Water Pressure.

Walworth I.P.S. and W.P.S. Hi-Test Pipe with oversize threads are principally for use in underground water and gas distribution systems. For complete details write for Bulletin 57.

You'll find pertinent information on Walworth's complete line of valves, fittings, pipe, and pipe wrenches in the new Walworth Catalog 42. Included are 78 pages of practical engineering data that simplify valve selection and make piping layouts easier. Write, on business stationery, for your free copy. Address: Walworth Company, 60 E. 42nd St., New York 17, N. Y. Dept. D16.

ARMY E ARMY E NAVY

BOSTON WORKS
KEWANEE WORKS

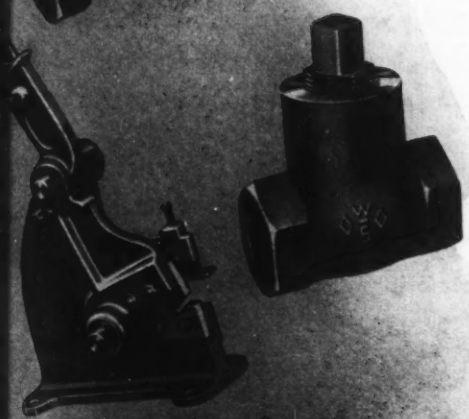
WALWORTH
valves AND fittings

WALWORTH ★ ★ VALVES AND FITTINGS ESTABLISHED 1842

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

ECONOMY IN LOW MAINTENANCE COST

These attractive, fact-packed booklets have been prepared by Watson-Stillman to give complete details of the line of Fittings, Valves and Wire Rope Shears.



Many engineers specify Watson-Stillman Forged Steel Fittings and Valves because they know that the best is the lowest in cost in the long run. W-S products are known for their Reliability, Long Wearing Qualities and Efficiency in high or low pressure services. These factors contribute to low maintenance cost, which should be your first consideration when buying fittings and valves.

Maintaining production lines at the present high rate of output requires more than unlimited supply of raw materials and skilled labor. Plant equipment must be kept moving. A breakdown in a pipe line, caused by a leak or structural weakness in a key spot, shuts down the whole system, piles up costs in lost man hours and increased overhead. Such losses might have been avoided by the installation, in the beginning, of W-S Forged Steel Fittings and Valves for high or low pressure service.

Watson-Stillman also manufactures a precision cutting shear for use on round and flat iron bars, flat stock and wire cable. It can be furnished for hand operation, or with pump for hydraulic operation. The Watson-Stillman Co., Roselle, N. J.

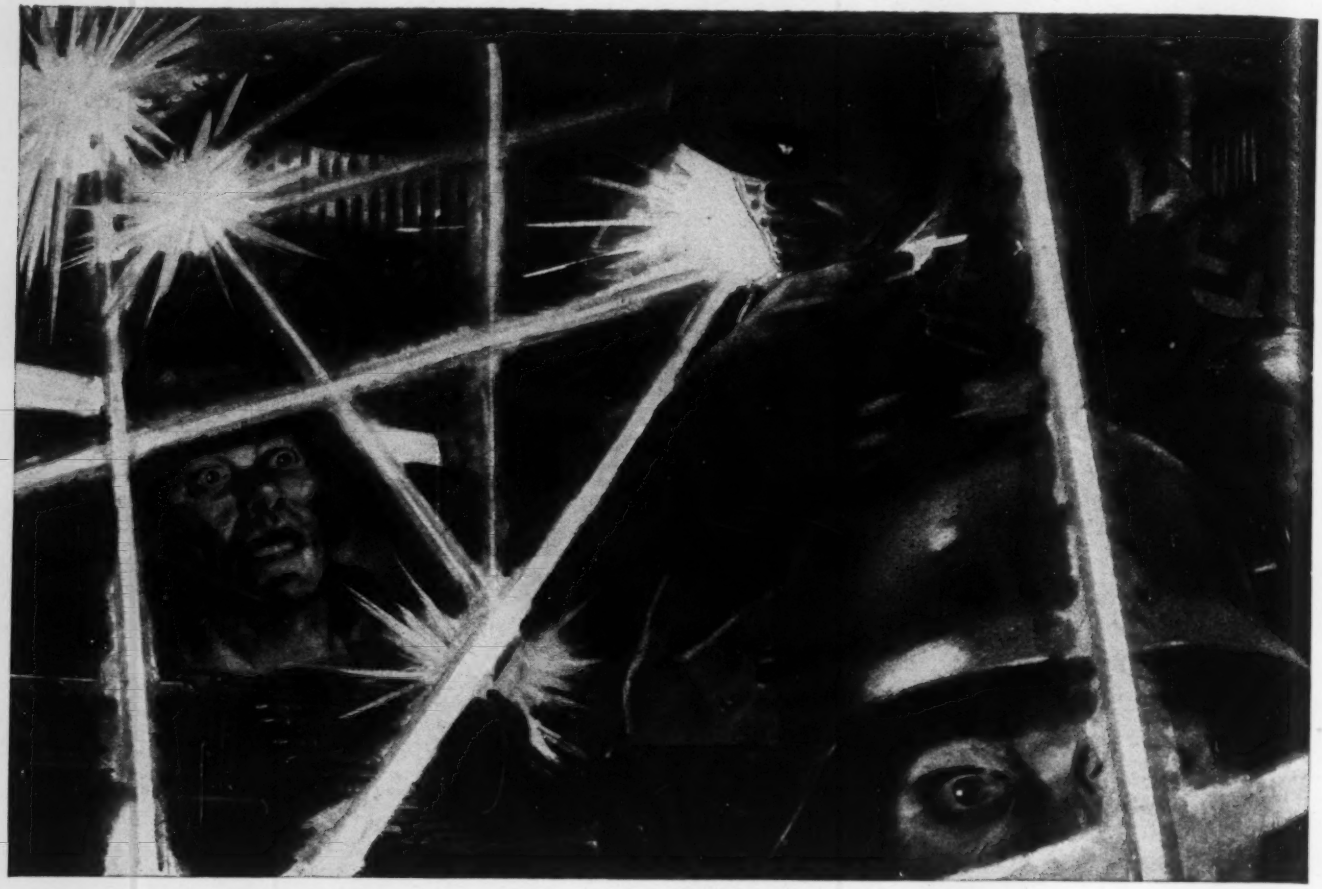
WATSON-STILLMAN

Distributor Products Division

Designers and Manufacturers of Forged Steel Fittings and Valves, and Hydraulic Equipment

5027

For Victory ★★★ Let's all be Scrappers



The shell that plays ping pong inside a tank

HEAT Treating—the process of using controlled temperature to put the pierce into anti-tank gun shells, is gradually sounding the death knell of the once invincible weapon of war. The armor plate of the tank that once shed bullets like rain drops, is being drilled into destruction by modern shot. Not only is the armor being pierced, but as the projectile enters the tank it blunts its drilling nose. Then taking advantage of the very armor it has just entered, it strikes and restrikes inside walls, like a ping pong ball, as many as 500 times.

In many heat treating processes, Trane Equipment is being used to rapidly cool oils and liquids used in quenching. In so doing, Trane Products speed ordnance production and ultimate victory.

Today Trane Air Engineers are sending Trane Equipment to war on every war production front. They are utilizing heat, cold, air movement, moisture control—all the elements of weather itself to help win the battles of production.

Tomorrow these men and this equipment will again turn to peace, using the development of today for the comfort and better living of tomorrow.

TRANE

AIR

THE TRANE COMPANY LA CROSSE, WISCONSIN

TRANE COMPANY OF CANADA, LTD., TORONTO

AIR CONDITIONING · · HEAT TRANSFER · · AIR HANDLING EQUIPMENT

Grueling test demonstrates durability of finish on G-E ALL-STEEL COILS...

Baked Enamel successfully resists 144 hours' exposure to salt spray

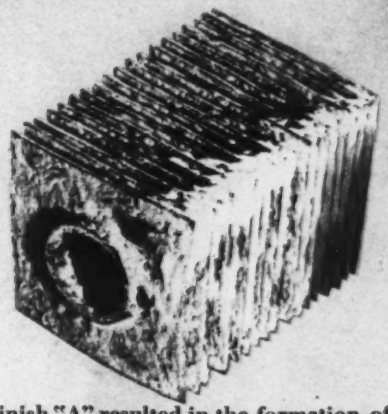
SUBJECTED to one of the most severe accelerated corrosion tests that can be imposed, the finish on G-E all-steel coils has clearly demonstrated its outstanding durability.

As a preliminary to selecting a standard coil finish, G-E exposed many types of commercial coatings to salt spray for 144 hours. Photos in the adjoining column clearly show the results of three of these tests.

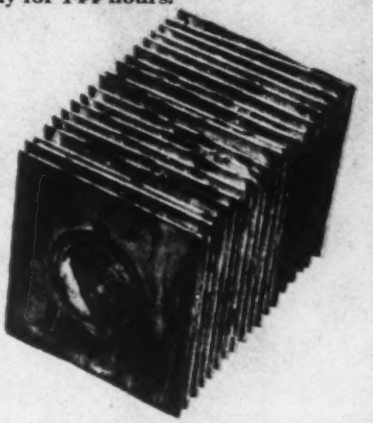
On the basis of these studies, G-E adopted as standard the finish which showed the highest immunity to this exacting test—baked enamel on specially prepared surface.

This convincing evidence of durability enables G-E to extend its one-year warranty against defects in materials and workmanship to cover the *finish* as well as the coil itself. Lasting finish, sturdy construction, permanent solder-bonding of fins to tubes, *prompt delivery* . . . these are among the reasons for bringing your coil requirements to G-E.

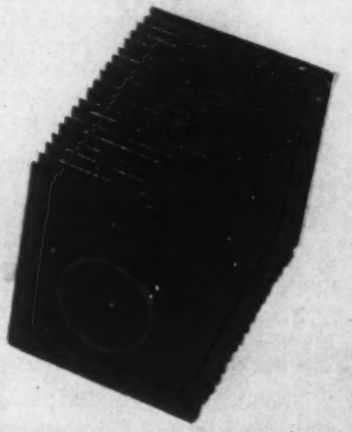
For full information, call the nearest G-E office—or write to *General Electric Company, Air Conditioning and Commercial Refrigeration Divisions, Section 35512, Bloomfield, New Jersey.*



Finish "A" resulted in the formation of white corrosion products that clogged the fins, when coil was exposed to salt spray for 144 hours.



Finish "B" showed extensive rusting at coil joints and fin edges after the same test.

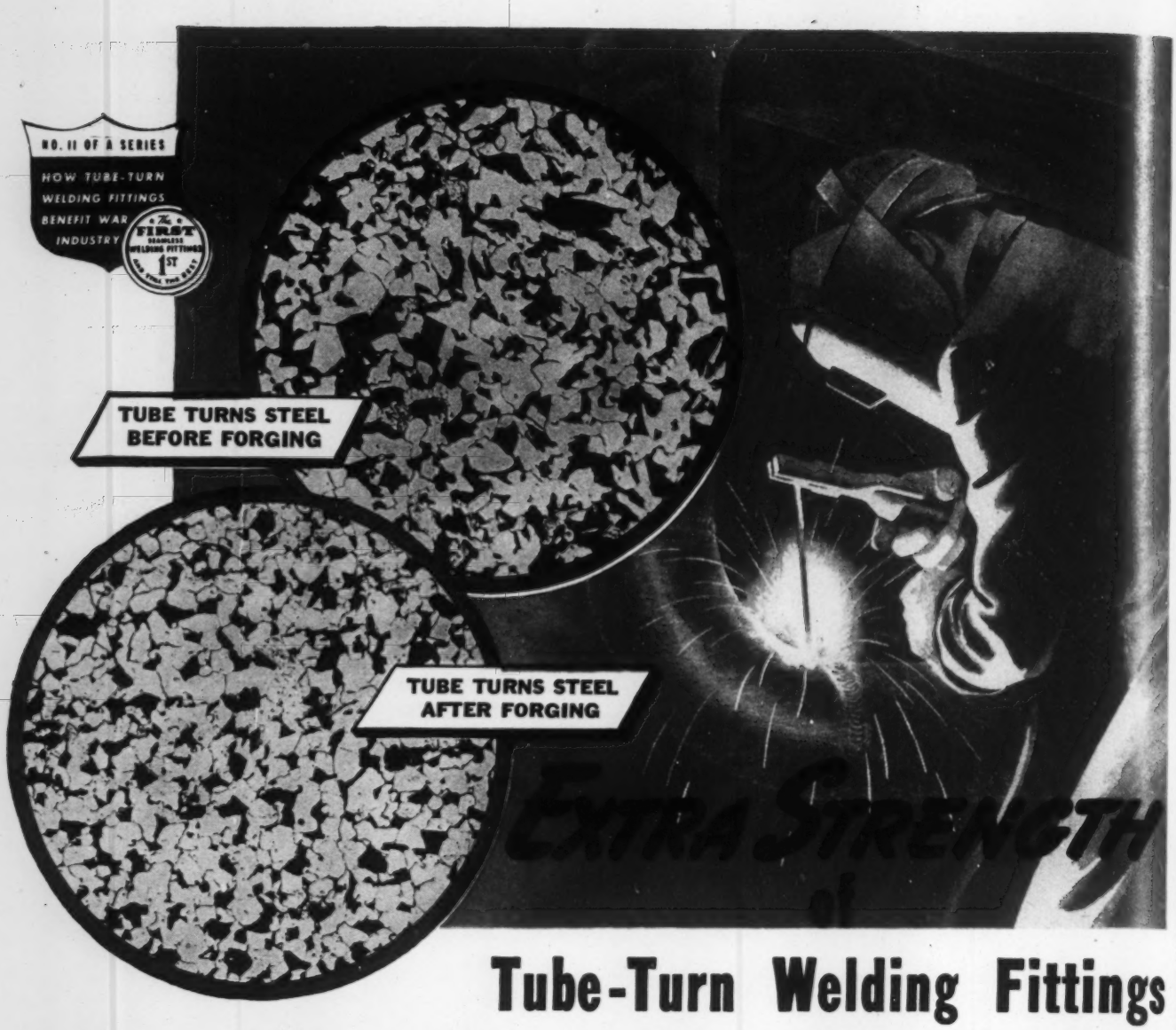


Baked enamel on specially prepared surface—the standard G-E finish—remains undamaged after salt spray exposure.

☆ BUY WAR BONDS ☆

GENERAL ELECTRIC

Hear the General Electric Radio Programs: The "G-E ALL-GIRL ORCHESTRA," Sundays 10 P. M., EWT, NBC..."THE WORLD TODAY" News, Every Weekday, 6:45 P. M., EWT, CBS


NO. II OF A SERIES
HOW TUBE-TURN WELDING FITTINGS BENEFIT WAR INDUSTRY
FIRST SEAMLESS WELDING FITTINGS
1ST
TUBE TURNS STEEL BEFORE FORGING
TUBE TURNS STEEL AFTER FORGING
EXTRA STRENGTH

Tube-Turn Welding Fittings prolongs piping service under wartime demands!

URGENT three-shift war plant schedules demand uninterrupted piping service—yet they impose triple duty on vital piping arteries. Fittings and joints bear the brunt of this wear and strain.

Tube Turns' exclusive manufacturing process actually improves on the top quality seamless steel tubing from which these fittings are forged. Proof lies in the 100X photomicrographs shown here. The finer grain quality in the Tube Turns metal structure guarantees the added strength and greater resistance to wear and corrosion. Even *better* proof lies in the long, unfailing service Tube-Turn Welding Fittings are rendering in thousands of war plants today.

TUBE TURNS (Inc.) Louisville, Ky. *Branch Offices:* New York, Chicago, Philadelphia, Pittsburgh, Cleveland, Dayton, Washington, D. C., Houston, San Francisco, Seattle. . . . . *Distributors located in principal cities.*

TUBE-TURN

Welding Fittings and Flanges

BIG CONSTRUCTION VOLUME SEEN IN POSTWAR DECADE

America's acute housing need will create three allied job-making construction activities which likely will produce a high level of employment in building and construction for ten years after the war, according to Irving W. Clark, of the Westinghouse Electric and Mfg. Co., who recently listed the three companion markets both for labor and the products of the nation's factories and mills as:

1) New homes, for which he said there is a postwar need of at least 1,000,000 units a year.

2) Home modernization.

3) Additional public works and commercial buildings, such as streets, water systems, schools, churches and stores, all of them essential to keep in step with housing expansion.

In dollar value, there is an even larger potential market in home modernization and additional public works and commercial buildings than in new home construction, Mr. Clark said in a speech to a combined convention session of the National Wholesale Hardware Association and the National Association of Sheet Metal Distributors.

He estimated that a well balanced and completely effective program of permanent public works and commercial buildings will require on a national average the spending of as much as $1 to $1.50 for each dollar spent in new house construction. The home modernization market could easily equal or probably exceed by from 25 to 50 per cent the number of dollars that will be spent in new house construction, according to Mr. Clark.

Mr. Clark urged that studies be made on a national and local scale of the actual and probable housing requirements, with special attention centered upon the demands for public works and commercial buildings.

Westinghouse has complete plans in readiness for reconversion to civilian production as soon as war production demands slacken, it was disclosed at the company's annual conclave of officers and managers held recently. Other highlights of the reports made at this meeting of the men who manage the 25 principal manufacturing divisions and the district operations of the company included these forecasts:

1) While a period of readjustment to peacetime conditions must take place, it should be no more difficult than our adjustment to wartime conditions.

2) The pentup demands for the goods of peace will be unprecedented. These goods in many factories and homes are wearing out.

3) The means of purchasing will exist after the war as never before —in cash, bonds, and credit.

HOWATT SERVES ON NEW FUEL CONSERVATION GROUP

John Howatt, chief engineer of the Chicago board of education and a member of HPAC's board of consulting & contributing editors, was named by Mayor Edward J. Kelly last month as a member of the executive committee on fuel conservation for the Chicago metropolitan area. Mr. Howatt has been active in wartime conservation work as chairman of the ASHVE's war service committee, and chairman of the society's Illinois chapter engineering advisory committee for fuel conservation.

WHY GAGE ROOMS NEED CONDITIONING

When metal parts of precision war mechanisms made in plants situated in the south fit perfectly with parts made in plants up north, no small portion of the credit goes to operations conducted under controlled temperature and humidity conditions in the gage room of the Cincinnati ordnance plant of the United States Army. In the air conditioned laboratory are master gages for calibrating the gages that are used by manufacturers making Army supplies. Here checking is done to insure that gages all over the country are in accord so that parts from one area will fit those from another.

To avoid variations in the gages due to weather, constant conditions are maintained within the room. Temperature is held at 68 F with a variation not to exceed 1 F, and the relative humidity is held below 50 per cent. The gages tested include those measuring length to 1/10,000,000 of an inch, electrolimit gages, thread gages, plug gages, and depth gages.

THE EDITOR'S PAGES

The purpose of air conditioning in the room is to have the same conditions for testing at all times. Temperature variations are not permitted as they will cause changes in dimensions of metal and will make the gages read inaccurately. Control of relative humidity is important in a gage room since no rust or corrosion, due to moisture condensation, can be permitted. In addition, air must be dust free for the fine instruments to remain accurate.

In laying out the air conditioning installation, engineers of the Cincinnati Air Conditioning Co., Carrier dealer, took into account the hottest day on record in Cincinnati (108 F) and the coldest day in the records of the Weather Bureau (—23 F) so that even on extreme days the calibration work could be carried on.

INDEX FOR YEAR 1943 READY SOON

A complete index for the year 1943 for Heating, Piping & Air Conditioning (including, of course, the Journal Section of the American Society of Heating and Ventilating Engineers) will soon be available and may be had by subscribers free of charge upon application to The Editor, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2, Ill.

This index covers volume 15, numbers 1-12, January-December 1943. Titles of all articles and papers are listed alphabetically, with numerous cross references. The articles and papers are also classified by the authors' names. The index thus comprises a key to the wealth of valuable information and data which have appeared in these pages during the current year.

THE EDITOR'S PAGES

STUDY SUMMARIZES POSTWAR PLANS

American industry's blueprints for the giant task of converting a record wartime production back to civilian goods without loss of employment have been summarized in Postwar Planning Now, a new study published by the New York Journal of Commerce. Much of the conversion task will depend upon the government's policy of contract termination, inventory disposal, and unloading the 1753 war plants it has spent $9,000,000,000 to construct during the war, according to the study.

A midwestern plant normally employing 32,000 workers already has enough postwar projects to take care of 55,000 of the 90,000 employed there now. About 15,000 are expected to drift elsewhere and the remainder may find employment on products now in the research laboratories, says the study, which was based on interviews with key manufacturing executives and government officials throughout industrial America. Copies may be had, for 25 cents, from the New York Journal of Commerce, 63 Park Row, New York City.

TO SPONSOR BOSTON SYMPHONY

The Allis-Chalmers Mfg. Co. will sponsor the weekly broadcast concerts of the Boston Symphony on the Blue Network. The broadcasts will be heard under Allis-Chalmers' sponsorship every Saturday evening from 8:15 to 9:15 p. m., EWT, beginning on a date to be announced shortly. Meanwhile they will continue as an outstanding sustaining feature of the network.

INDOOR CLIMATE INSTITUTE PLANS ACTIVITIES

A national program of education was launched in behalf of the heating, cooling, and air conditioning industries at the first joint meeting of officers, directors, and advisory council to the board of the Indoor Climate Institute held early last month.

Pointing out the job that can be done on an industry wide basis, ICI President Paul B. Zimmerman said: "The American public has benefited immeasurably from the cooperative efforts of manufacturers who have been inspired by a desire to have all the members of an industry subscribe to policies, principles, and practices which assure the public of better products and better living conditions. Today, heat, next to food, is the most important factor affecting the health of Americans. The activities of the Indoor Climate Institute will include a far-reaching program of training and public education on improved living standards."

ICI officers shown in the photo are, from left to right, seated, T. A. Crawford, Mr. Zimmerman, and R. E. Moore, and standing are E. N. McDonnell and L. N. Hunter.

STANDARDS ASSOCIATION MARKS 25TH YEAR

At a luncheon meeting to be held December 10 at the Hotel Roosevelt, New York City, the American Standards Association will mark the 25th anniversary of its founding. Started as a result of the production problems of the last war, the ASA has in the past year completed more than 40 emergency jobs for the armed services and wartime industry.

ARMY BUILDS OVERSEAS HOSPITAL TRAIN

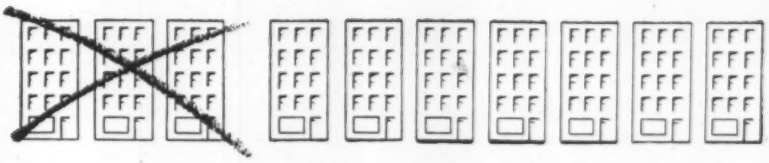
The Army's first overseas type hospital train, built specifically for use in theaters of operations, is of all-steel construction and consists of 10 cars, including six ward cars, a kitchen car, utilities car, and two personnel cars for officers and enlisted men. Each car is slightly more than half the length of the ordinary railroad car and was designed to negotiate the sharp curves, narrow bridges and tunnels of foreign railways.

Features of the new train include a pressure ventilating system, complete sterilization units and emergency operating areas in each ward car. The train operates as a complete unit in itself. The utilities car furnishes electric current from two diesel generators for light, ventilation and refrigeration. Two oil fired steam boilers provide heat and hot water. The boilers or generators will operate for 14 hr without refueling.

PHOTOGRAPHING REFRIGERANT VAPORS

At what rate of speed does a refrigerant vapor give up its heat load? Here in the research laboratories of the York Corp., Dr. R. E. White is searching for the answer with the aid of a movie camera and a specially built condenser which enables both camera and research men to observe the process of condensation through glass portholes.

Object of this project is to design more efficient condensers. At present, vapors condensing on the walls of a condenser build up their own insulation, thus cutting down the efficiency of the heat absorbing process. Engineers still seek a method by which vapors will form in larger drops and leave more condensing area free.

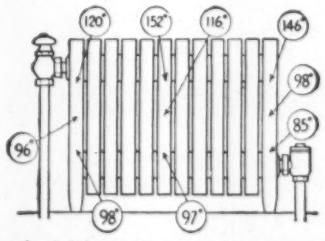


Yes . . . 7 out of 10 buildings

can get more heat with less fuel

With fuel rationing, it is more important than ever that building owners thoroughly investigate their heating systems to make sure they are not wasting valuable fuel.

Webster Engineers have found through thousands of surveys that seven out of ten large buildings in America (many of them less than ten years old) can get more heat per unit of fuel consumed.



Actual proof of low radiator temperatures! Here are actual temperatures at nine points and showing average radiator temperature of 112° F. . . . due to scientifically controlled turbulence.

Before the development of the Webster Moderator System, steam was either "off" or "on" except for the control provided by the radiator supply valve. There was no better way to control *quantity* of steam delivery to radiators.

The Webster Moderator System prevents the discomfort of "scorching hot" radiators by making possible low radiator temperatures . . . Eliminates annoying and fuel-consuming surges of heat—or "cold spots"—by supplying heat *continuously* to all radiators through orifices and central controls. There is no waste of valuable fuel through overheating.

If you are interested in getting more heat with less fuel, write for "Performance Facts." This free booklet gives case studies of 268 modern steam heating installations and how they are effecting great savings in fuel.

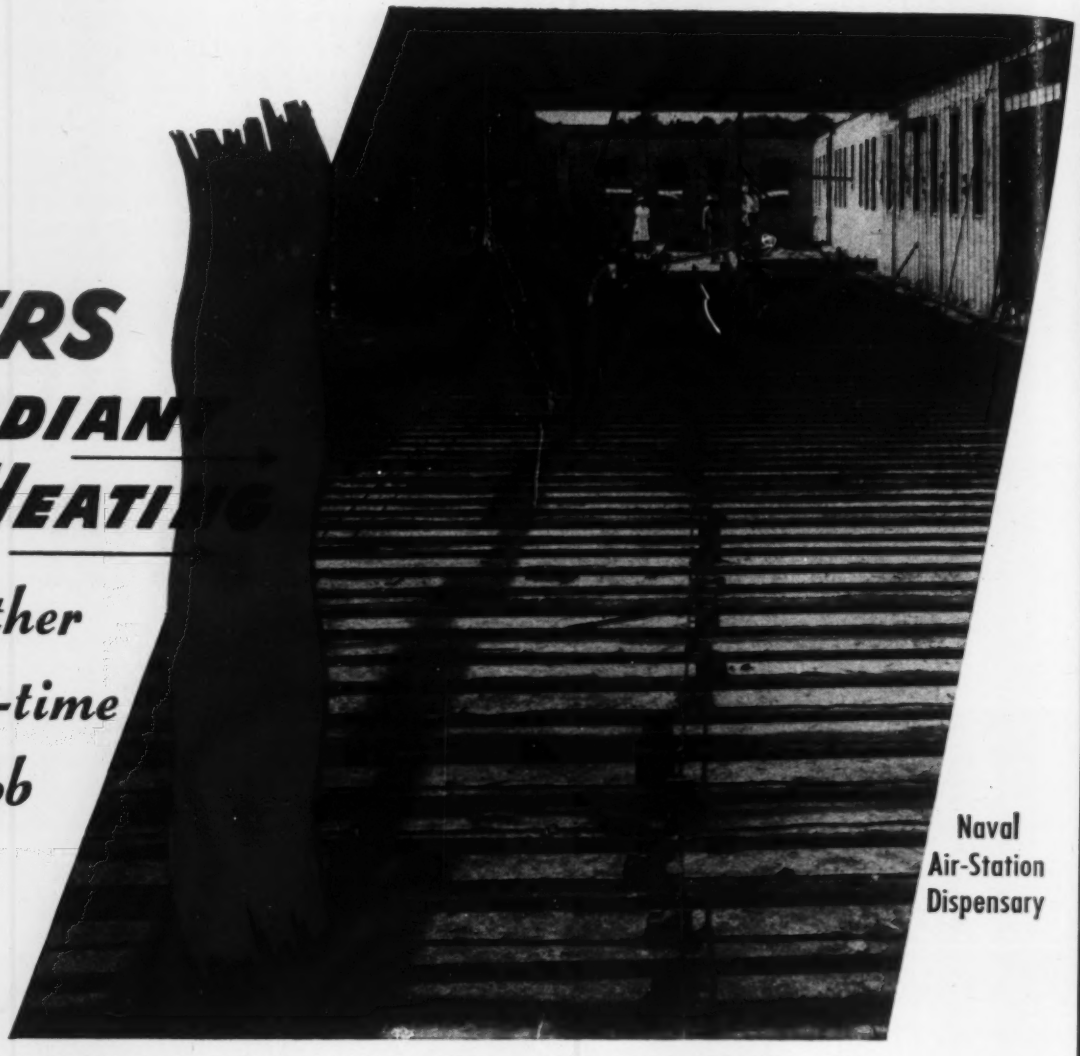
WARREN WEBSTER & CO., Camden, N. J.
Pioneers of Vacuum System of Steam Heating :: Est. 1888
Representatives in principal U. S. Cities :: Darling Bros., Ltd., Montreal

ARMY E NAVY
Making Boosters for U.S. Army Ordnance

Webster
Steam Heating

BYERS RADIANT HEATING

gets another war-time job



Naval Air-Station Dispensary

CORROSION COSTS YOU MORE THAN WROUGHT IRON

Byers Radiant Heating was again enlisted for military service when the new Naval Air Station Dispensary was built at Jacksonville, Florida. Two wards are warmed with pipe coils of Byers Wrought Iron, embedded in the concrete floor. The architects and engineers were Robert and Company, while Henley and Beckwith were the contractors and fabricators.

Coils are made up of 224 pieces of 1-inch Byers Wrought Iron pipe, each 22-feet long, welded to headers. The coils are pitched and vented, with provision for draining. Heating medium is water, warmed by a steam heat exchanger. Minneapolis-Honeywell thermostats control the temperatures.

This is the second Byers Radiant Heating Installation for the station; the first was in two chapels built about a year ago.

The widespread use of Byers Radiant Heating in all varieties of structures to meet all kinds of needs is the best evidence of its almost universal possibilities. Whether you are planning some essential structure for today, or are doing a little preliminary planning about tomorrow, radiant heating deserves a prominent part in your thinking.

This widespread use also indicates the wide professional recognition of the service qualities of wrought iron. Wrought iron's unique structure—high purity base metal, and a multitude of tiny glass-like silica slag fibers—makes it highly corrosion-resistant. The fibers act as a mechanical barrier against pitting and penetration, and anchor the surface film that protects the underlying metal. Then, too, Byers Wrought Iron combines desirable thermal properties with excellent welding and bending qualities. And it is *proven* for the job.

Do you have our technical bulletin, "Byers Wrought Iron for Radiant Heating Installations?" We will gladly send a copy. You will find it factual and helpful.

A. M. Byers Company. Established 1864. Offices in Pittsburgh, Boston, New York, Philadelphia, Washington, Chicago, St. Louis, Houston, Seattle, San Francisco.

BYERS
GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE ALLOY STEELS • OPEN HEARTH ALLOY STEELS
CARBON STEEL TUBULAR PRODUCTS

"ALNOR" VELOMETER

DIRECT READING AIR VELOCITY METER

"Alnor" Velometer fills the need for a simple, accurate means of determining air velocity in air conditioning, forced air exhaust ducts, etc. Peak efficiency operation is now more important than ever before . . . and Velometer with its many simple attachments assures correct readings, under the most adverse conditions, in feet per minute, right on the scale! These readings enable you to gauge the systems efficiency and MAKE NECESSARY ADJUSTMENTS to assure greatest efficiency. Write for new catalog now!

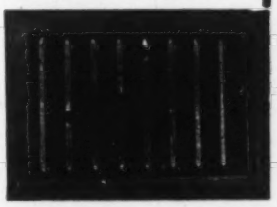
Illinois Testing Laboratories, Inc.

412 N. La Salle St., Chicago, Ill.

"NON-METALLIC" REGISTERS

FOR DEFENSE PROJECTS

Approved by Government Authorities for air-conditioning installations in Hospitals, Industrial Plants, Fortifications, etc., under Army, Navy or Maritime rulings. Field-tested STANDFORATED Register and Grille designs of durable, tempered Masonite are fabricated in standard sizes or to your specifications. Write for complete information.



DESIGN NM-SLD—"Non-Metallic" Sliding Damper Foundation Vent.

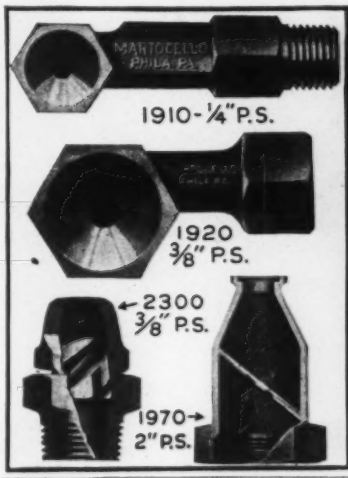
STANDFORATED

FOR PRODUCTION SPEED-UP—

Specify Precision Processed STANDFORATED Perforations. Industrial Screens, Filters, Guards, etc., made to specifications for vital industries. Handy catalog sent on request.

STANDARD STAMPING & PERFORATING CO.

3151 W. 49th PLACE • CHICAGO, ILLINOIS



MARTOCELLO SPRAY NOZZLES

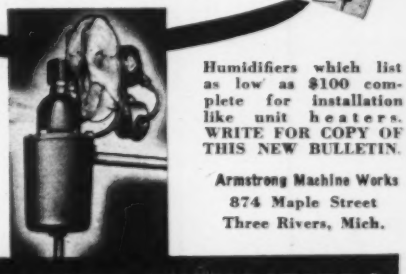
Manufactured with precision and of a design which has been thoroughly tested for results and durability, they are guaranteed to give you satisfaction.

Successful efficient results depend largely upon selecting the proper number and type of Nozzle suitable for your installation. Consult with us.

Jos. A. Martocello & Co.

229-231 North 13th St., Phila., Pa.

A BULLETIN ON HUMIDIFICATION

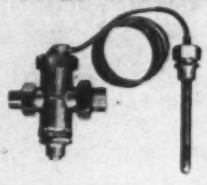


Need for humidification . . . desirable humidities for various industries . . . advantages . . . how to select humidifiers . . . facts, figures, tables . . . operating principle, capacities, prices and details on Armstrong Steam Type Humidifiers which list as low as $100 complete for installation like unit heaters. WRITE FOR COPY OF THIS NEW BULLETIN.

Armstrong Machine Works
874 Maple Street
Three Rivers, Mich.

ARMSTRONG UNIT HUMIDIFIERS

Control temperature of ALL LIQUIDS . . . at LOW COST



STERLING THERMOTROL

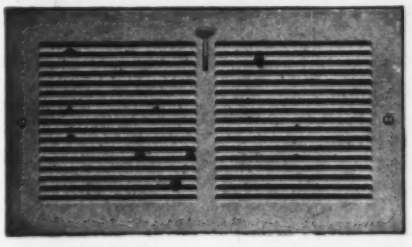
Heating Pumps . . . Temperature Controls . . . Heating Specialties.

Write for latest bulletins.

This Control is showing manufacturers and processors a new idea in simple *low cost*, efficient tank and process TEMPERATURE CONTROL. Effective in steam-heated hot water tanks, fuel oil preheaters, plating baths, heat exchangers — wherever liquids must be kept at constant temperatures. For pressures up to 125 pounds, temperature ranged to 300° F. Saves on *first cost* and in *production cost.*

STERLING, INC.

Sales Office: 4015 N. Oakland Ave.
Factory: 3738 N. Holton St.
Milwaukee, Wisconsin



Aire-Flex 7032 Single Louvre Adjustable Register

● Auer is now engaged principally on vital aircraft parts and other wartime products. We are still able to furnish most styles of registers from inventory stocks, for all purposes permitted by Federal regulations.

Auer Register Book sent on request.

THE AUER REGISTER COMPANY, Cleveland, O.

AUER REGISTERS

& GRILLES · For Air Conditioning *and* Gravity

CLASSIFIED ADVERTISING

cents for each word including heading and address. Count nine words for keyed address. Minimum $2.00 for each insertion. One inch $4.00. Cash must accompany order. Copy must be in our hands by the twenty-fifth of the month previous to issue.

EQUIPMENT

USED EQUIPMENT WANTED: Air Conditioning and Refrigerating Machinery or complete Systems, large or small, all types. E. M. Fairbanks Co., 333 Fifth Ave., New York 16, N. Y.

Engineer has Patent Pending on Vertical Projection-Type Gas Unit Heater. Desires to find manufacturer building heaters who would be interested in Unit Heaters. Will give exclusive use of Patent to one firm and would like territory as part of agreement. Address Key No. 385-A, Heating, Piping & Air Conditioning, 6 No. Michigan Ave., Chicago 2, Ill.

SITUATION WANTED

Fan and apparatus engineer with broad background in application and trouble shooting, fan designing and residential heating seeks place in manufacturer's development program. Understands steel and copper blast coils, industrial ventilation and dust collection. Prefers smaller city location. 3-A-H in draft. Address Key No. 384-A, Heating, Piping & Air Conditioning, 6 No. Michigan Ave., Chicago 2, Ill.

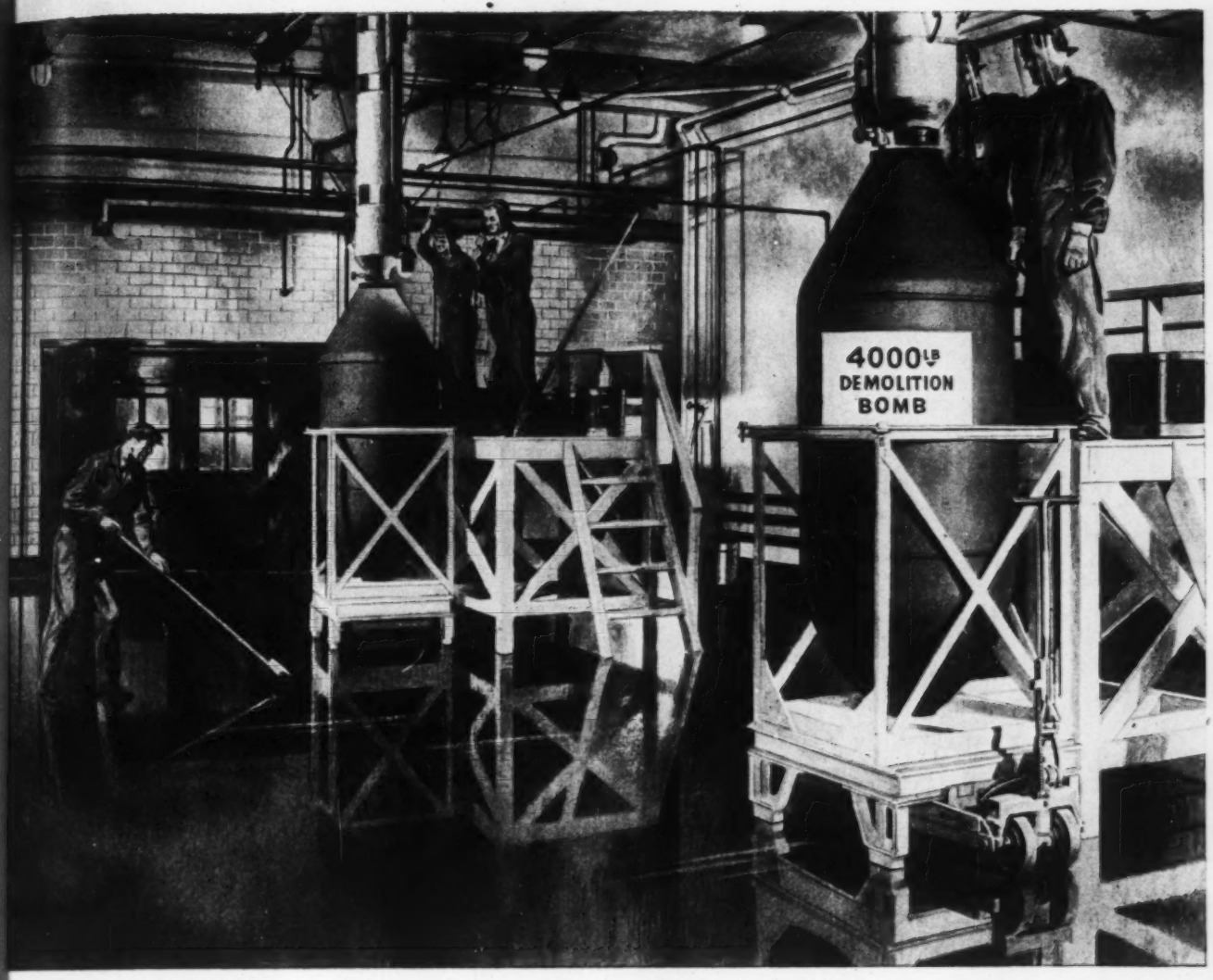
MECHANICAL ENGINEER

Defense work for mechanical engineer in Application Engineering in connection with air conditioning and ventilating installations and systems. Experience in layout of air conditioning and ventilating systems desired. Location: Pittsburgh and other cities. Salary open. Write the Westinghouse Electric & Manufacturing Co., Room 1415, Union Bank Building, Pittsburgh, Pa., for application.

Index to ADVERTISERS

Acme Industries 155
Aerofin Corp. 134
Air Reduction Sales Co. ..... *
Air-Maze Corp. ..... *
Airtemp, Division of Chrysler Corp. . 6
Airtherm Mfg. Co. 155
Alco Valve Co. 42
Allen Corp. 159
Allis Co., Louis, The ..... 19 and 20
American Air Filter Co., Inc. ..... *
American Blower Corp. ..... 8 and 9
American Brass Co. 4
American Chain & Cable Co., Inc. ... 13
American District Steam Co. 156
American Pipe Bending Machine Co., Inc. 162
American Rolling Mill Co. ..... *
American Steel & Wire Co. 166
Anderson Co., The V. D. ..... *
Anderson-Stolz Corp. ..... *
Apex All-Weather Products Co. .... *
Armstrong Cork Co. 14
Armstrong Machine Works 163
Auer Register Co. 163
Aurora Pump Co. 157
Automatic Products Co. 153
Badger & Sons, E. B. ..... *
Barber-Colman Co. ..... *
Bear Manufacturing Co. 153
Bell & Gossett Co. 31
Bonney Forge & Tool Works 152
Bryant Heater Co. 48
Buffalo Forge Co. ..... 32 and 33
Bullard Co., The ..... *
Burnham Boiler Corp. 154
Byers Co., A. M. 70
C-B Tool Co. 161
Campbell Heating Co. 39
Carbondale Div., Worthington Pump & Machinery Corp. ..... 54 and 55
Carey Co., Philip ..... *
Carnegie-Illinois Steel Corp. 166
Carrier Corp. 44
Cash Co., A. W. ..... *
Century Electric Co. ..... *
Clarage Fan Co. ..... Inside Back Cover
Clifford Mfg. Co. ..... *
Columbia Steel Co. 166
Combustion Engrg. ..... *
Connor Engineering Corp., W. B. 160
Crane Co. 24
Crocker-Wheeler Electric Mfg. Co., Div. of Joshua Hendy Iron Works ..... Inside Front Cover
Curtis Refrigerating Machine Co. .... *
Dayton Rubber Mfg. Co. 41
Detroit Lubricator Co. 12
Detroit Stamping Co. ..... *
Dole Valve Co., The 146
Dow Chemical Co., The ..... *
Dravo Corporation 16
Dunham Co., C. A. 22
Eagan Co., Walter H. ..... *
Economy Pumps, Inc. 162
Edison, Inc., Thomas A., Instrument Div. ..... *
Electric Arc, Inc. ..... *
Ellsworth Pipe and Supply Co. ..... *
Emerson Elec. Mfg. Co., The 43
Extruded Plastics, Inc. ..... *
Fedders Mfg. Co., The ..... *
Fisher Governor Co. ..... *
Fitzgibbons Boiler Co., Inc. 50
Flori Pipe Co., The 21
Freeman Stoker Div., Ill. Iron & Bolt Co. ..... *
Frederick Iron & Steel Co. 161
Frick Co. ..... *
Fulton Sylphon Co. 5
G. & O. Mfg. Co., The ..... *
Gehl Bros. Mfg. Co. ..... *
General Controls Co. 139
General Electric Co. 65
Grant Wilson, Inc. 59
Grinnell Co., Inc. .... Outside Back Cover
Haines & Co., Wm. S. ..... *
Handy and Harman 151
Hansen Mfg. Co., Inc. 149
Hays Corp., The 158
Hodgman Rubber Co. ..... *
Hoffman Specialty Co., Inc. ..... *
Holcomb & Hoke Mfg. Co. ..... *
Holtzer-Cabot Electric Co., The 26
Hotstream Heater Co. ..... *
Howell Electric Motors Co. 45
Hussey & Co., C. G. ..... *
Ilg Electric Ventilating Co. ..... *
Illinois Engineering Co. ..... *
Illinois Testing Laboratories, Inc. 163
International Nickel Co., Inc., The .. *
Iron Fireman Mfg. Co. ..... *
Jenkins Bros. 136
Jewel Mfg. Co. ..... *
Johns-Manville 145
Johnson Co., S. T. ..... *
Johnson Service Co. 49
Kennard, Inc., Sam 145
Kewanee Boiler Corp. 10
Kieley & Mueller, Inc. 147
Kinetic Chemicals, Inc. ..... *
Kramer Trenton Co. 142
Ladish Drop Forge Co. 15
Leland Elec. Co., The ..... *
Lilie-Hoffman Cooling Towers, Inc. .. *
Lincoln Elec. Co. ..... *
Link-Belt Co. 18
Little Mfg. Co., M. S., The 148
Maid-O'-Mist, Inc. 159
Malleable Iron Fittings Co. 133
Marley Co., The ..... *
Marlo Coil Co. 53
Marsh Tritrol Co. ..... *
Martocello & Co., Jos. A. 163
May Oil Burner Corp. 147
McAlear Mfg. Co. 27
McDonnell & Miller 51
McQuay, Inc. ..... *
Mercoid Corp., The ..... *
Meriam Co., The ..... *
Midwest Piping & Supply Co. 7
Minneapolis-Honeywell Regular Co. .. *
Modine Mfg. Co. ..... *
Mortell Co., J. W. 151
Mueller Brass Co. 37
Mundet Cork Corp. ..... *
Murray Mfg. Co., D. J. 30
Nash Engineering Co. 72
National Tube Co. 166
Nelson Corp., Herman.....34, 35 and 160
Nesbitt, Inc., J. J. 40
Niagara Blower Co. ..... *
Orr & Sembower, Inc. 144
Owens-Corning Fiberglas Corp. 165
Patterson-Kelley Co., Inc., The ..... *
Pedrick Tool & Machine Co. ..... *
Peerless Manufacturing Corp. ..... *
Penn Electric Switch Co. ..... *
Petroleum Heat & Power Co. 150
Pomona Pump Co. ..... *
Porter & Co., H. W. ..... *
Powers Regular Co., The ..... *
Propellair, Inc. 61
Prox Co., Inc., Frank ..... *
R-S Products Corp. 140
Randall Graphite Products Corp. .... *
Reading Pratt & Cady Div., American Chain & Cable Co., Inc. 13
Reznor Mfg. Co. 46
Rhoads & Sons, J. E. ..... *
Ric-wiL Co., The ..... *
Ridge Tool Co., The 36
Ruberoid Co. ..... *
Ruemelin Mfg. Co. ..... *
Rutland Fire Clay Co. ..... *
SKF Industries, Inc. 143
Sales & Co., Murray W. 57
Sall Mountain Co. ..... *
Sarco Co., Inc. 56
Sheetlock Co. 157
Smith Co., Inc., H. B., The ..... *
Spang-Chalfant, Inc. ..... *
Standard Stamping & Perforating Co. 163
Star Electric Motor Co. 17
Staynew Filter Corp. ..... *
Sterling, Inc. 163
Streamline Pipe & Fittings Div., Mueller Brass Co. 37
Sturtevant Co., B. F. ..... *
Sulflo, Inc. ..... *
Taco Heaters, Inc. 47
Taylor Forge & Pipe Works 58
Taylor Instrument Co. 28
Tilco-Fin, Inc. ..... *
Todd Combustion Equipment, Inc. ... 60
Tennessee Coal, Iron & R. R. Co. 160
Trade-Winds Motorfans, Inc. 161
Trane Co., The 63
Tube-Turns, Inc. 60
Union Asbestos & Rubber Co. ..... *
United States Air Conditioning Corp. *
United States Steel Corp., subsidiaries 160
United States Steel Supply Co. 160
U. S. Machine Corp. 29
Universal Zonolite Insulation Co. .... *
Walworth Co. 62
Ward Leonard Electric Co. ..... *
Watson-Stillman Co., The 60
Webster & Co., Warren 60
Webster Engineering Co., The ..... *
Western Cartridge Company ..... *
Westinghouse Elec. & Mfg. Co. 135
White-Rodgers Electric Co. ..... *
Whitlock Mfg. Co. ..... *
Wiegand Co., Edwin L. 138
Williams & Co., J. H. ..... *
Wilson, Inc., Grant 58
Wing Mfg. Co., L. J. 137
Worthington Pump & Machinery Corp., Carbondale Div. ..... 54 and 55
"X" Laboratories, Inc. 1
X-Pando Corporation ..... *
Yarnall-Waring Co. ..... 29 and 150
York Corp. 141
York Heat, Div. of York-Shipley, Inc. 52
Young Radiator Co. ..... *
Youngstown Sheet & Tube Co. 25
Zink Co., John 148

Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in other issues is marked with an asterisk.



Why do they wax the floors in an ordnance plant?

THESE MEN ARE filling a 4000-lb. "block buster" with high explosive in the (censored) ordnance plant.

The floors of this plant are of waxed concrete and are polished every night. The walls of tile and high-gloss paint are kept shining clean. These precautions help prevent small particles of TNT from accumulating on the walls and floors.

As an additional safeguard against explosions, Dust-Stop Air Filters were installed in the air-conditioning system of the plant. These filters further reduce the hazard of explosive dusts by removing them from the air.

In scores of war plants

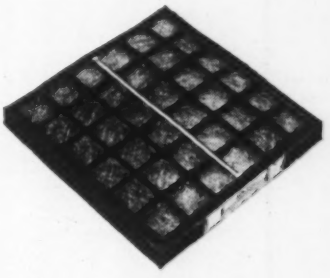
. . . Dust-Stops are today protecting workers and the products which they make. They guard delicately machined surfaces from the damage caused by grit and grime. They help assure the accuracy of bomb sights, portable radio transmitters, tank parts, and many other precision instruments and assemblies.

Low-price advantage

As original equipment for commercial and industrial installations, Dust-Stops cost only about 1¢ per CFM to install. Their replacement cost is less than 1/10th of 1¢ per CFM.

Dust-Stops may also be vacuum cleaned or gently rapped to remove excessive surface-dust accumulations. This process may be repeated once or twice to reduce maintenance costs still further.

Ask your regular supplier about Dust-Stops, made from materials now listed as non-critical. Or write for complete technical data to: *Owens-Corning Fiberglas Corporation, Toledo 1, Ohio. In Canada, Fiberglas Canada, Ltd., Oshawa, Ontario.*



FIBERGLAS*

DUSTOP*

*T. M. Reg. U. S. Pat. Off.

AIR FILTERS

Marching back to .. *What?*

DURING the first six months of peace, a U. S. Chamber of Commerce survey indicates, 1,015,000 families intend to build or buy new homes—592,000 intend to modernize kitchens — 496,000 plan new bathrooms.

But what kind of homes? How importantly will advanced design, improved construction and new materials influence their planning?

Architects and builders already have the answers to many such questions in the versatile performance of steel, not only in industrial buildings but also in dwellings. They know the fine record in industrial plant construction and maintenance made by U·S·S Steel Sheets.

For you sheet metal specialists that means tremendously increased demand for ductwork, roofing, siding, partitions, all the familiar applications.

In new or altered dwellings everywhere, there is need for the sort of strength, durability, resistance to weather and fire, provided in such full measure by U·S·S Steel Sheets.

We match your close attention to advanced shop practice, improved design, all the things that contribute to your skill in manipulating sheet steel. We offer our years of study and effort, our developments of steels with unique characteristics, each best suited to meet a certain set of conditions, to insure for the artisan all the advantages you get with U·S·S Steel Sheets.

As you meet the demand for new applications of steel, you may find yourself up against new problems, where an intimate knowledge of the various types of steel sheets would be invaluable. We shall be glad to help you with constructive suggestions, detailed practical data, such as we have assembled in the "U·S·S Sheet Metal Worker's Guide". Drop us a line today and we shall be glad to forward your copy. You incur no obligation, it's free.

U·S·S Steels for successful sheet metal workmanship

U·S·S GALVANIZED STEEL for sheet metal structures requiring the added protection of a zinc coating.

U·S·S COPPER STEEL to give twice the atmospheric corrosion resistance of regular steel at little individual cost.

U·S·S PAINTBOND — A galvanized Bonderized sheet that permits immediate painting and holds paint tighter. U·S·S Dul-Kote, a product with similar qualities, available in the South and West.

U·S·S HOT-ROLLED AND COLD-ROLLED STEEL to provide the basic advantages of steel, plus maximum economy, in accordance with the needs of each individual job.

U·S·S STAINLESS AND HEAT-RESISTING STEELS to assure high resistance to corrosion and heat, and to reduce weight.

U·S·S VITRENAMEL—Sheets designed especially for porcelain enameling.

U·S·S LOW ALLOY, HIGH TENSILE STEELS to resist corrosion and increase strength-weight ratio.

U·S·S STEEL SHEETS

CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
United States Steel Supply Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

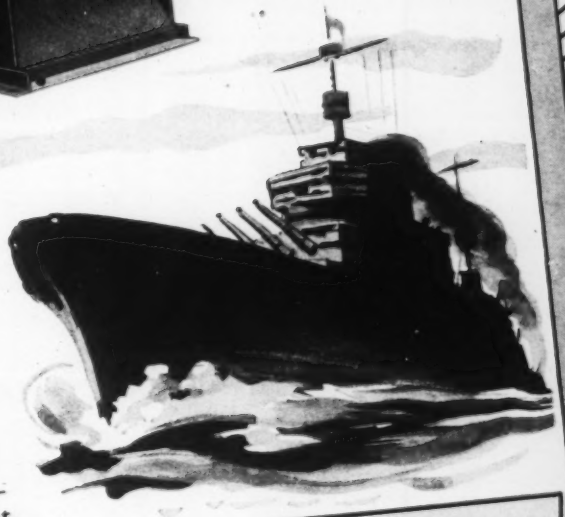
USS

UNITED STATES STEEL

...ey Come Better and *Faster* from CLARAGE

★ for Ship Ventilation: 17 sizes—capacities 100 to 100,000 c.f.m. (Other types of ventilating fans available.)

★ for Forced Draft: high-speed, self-limiting horsepower, rising pressure curve design—sizes to meet all conditions.



★ ...Fans and Blowers for Every Maritime Job!

There are no square pegs to fit round holes in the Clarage Marine fan line! Each unit has been designed to meet *your* requirements — built specifically to give the kind of service *you* must have.

★ For instance: Clarage Marine type fans are *all* steel — no cast iron. Steel will not shatter; it also reduces weight. Extreme compactness is another feature. We get this by streamlining the fan housings and by mounting fan wheels directly on the motor shafts—space saved from 20 to 35%. And complete specifications reveal other important advantages!

★ *One other thing: we're geared to make prompt deliveries. If you need fans in a hurry, we can move fast.*

★ The Navy, private ship builders, and industry find Clarage a good *source of supply* — not only for equipment as here shown, but for induced draft fans, unit heaters, unit air conditioners, etc. *We can do equally well for you. May we try?*

COMPLETE AIR CONDITIONING
•
COOLING
•
VENTILATION
•
FACTORY HEATING
•
MECHANICAL DRAFT
•
FANS and BLOWERS for INDUSTRIAL NEEDS

Clarage Fan Company Kalamazoo, Mich.

APPLICATION ENGINEERING OFFICES IN ALL PRINCIPAL CITIES